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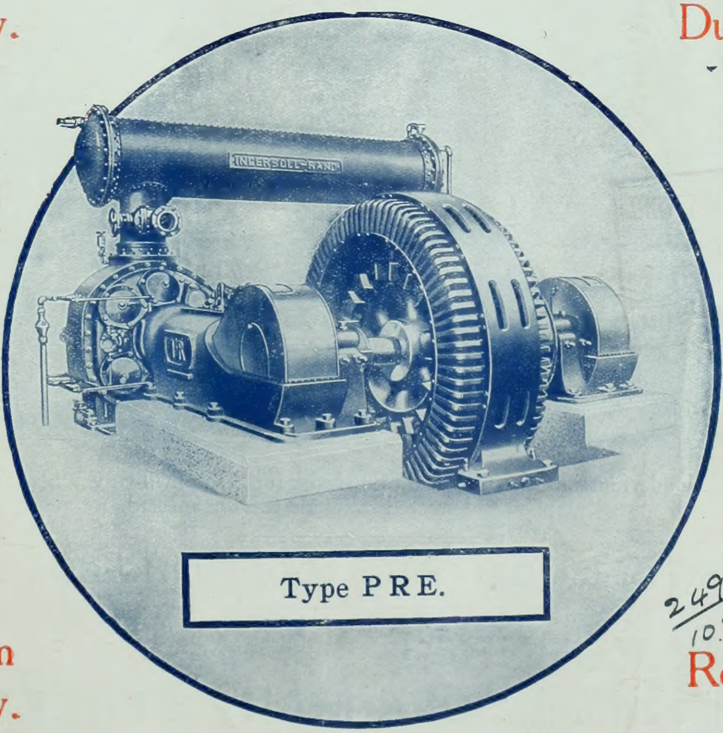

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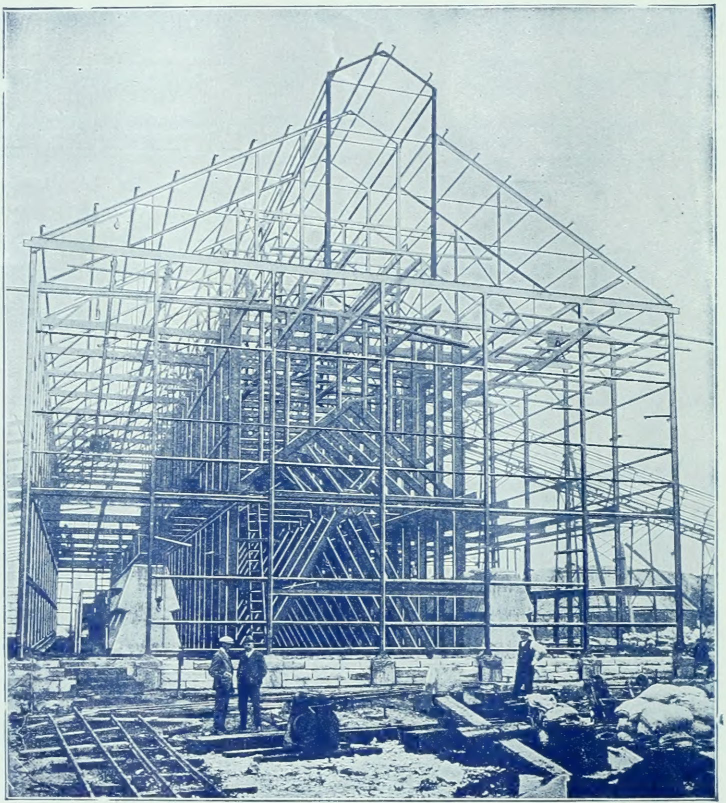

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Notes and News.

Farewell to Prof. Dobson.

The resignation of Prof. Dobson from the Johannesburg Municipal Service, and his impending departure on a trip round the world, have evoked some notable expressions of respect and esteem from his wide circle of professional and business friends. All these functions have had one feature in common, viz., a sincere and general desire to pay the highest tributes to the energy, ability and tact of the parting guest, and seldom has a public official in our midst been so honoured in this respect. The speeches on one occasion evoked, *apropos* of British trade prospects, the memorable expression from a prominent citizen, whose mission it is to represent American business interests, that "the world is not safe, unless England prospers." This tribute we believe to have been as sincere and spontaneous as it was happy and well received.

* * * *

Oil in Central Africa.

The shares of Nyassa Consolidated have lately been in demand in London. This buying appears to have been based on early knowledge that a powerful group has agreed to send an expedition to examine the company's territories for oil deposits. At the meeting of the company at the beginning of last month, the Chairman, in reply to questions, said that, so far as he knew, oil had not been discovered in the territories, "but," he added, "it is a territory in which one might expect to find oil, for there are large deposits of bitumen and other things which are usually associated with the presence of oil." The group which is understood to be sending an expedition is the Anglo-Persian.

* * * *

The Free Gold Market.

In connection with the restoration of the free gold market, the London "Times," in a tabular statement, shows the possible dividend effects on the Rand mines owing to the profit on the New York rate of exchange arising from the realisation of gold in America. Modder Deep is taken as an example of a rich mine, whose 100 per cent. dividend at normal sterling exchange, namely, 4.86 dollars would work out at 123 per cent. at the exchange rate of 4.25 dollars. The 11¼ per cent. dividend of Geduld, which is taken as an example of an average grade mine, would become 18½ per cent., while a poor mine like the Simmer Deep, whose last published working loss amounted to £46,000 would have this converted into a profit of £27,000. The present New York exchange rate approximates 4.19 dollars, hence the foregoing calculations of additional profit are actually within the mark. The foregoing allows for shipping and insurance costs, also additional taxes payable [illegible] the case of rich and average mines.

* * * *

[illegible] in England.

[illegible] contemporary: "It is [illegible] [illegible]plicitly warned as to [illegible] Already it has gone far en[illegible] winter ever known in the coal trade [illegible] bad for the key industries of the country, bad [illegible] consumers, bad for everybody but the lordly miners, w[illegible] their Sankey pay for a Sankey day's work. Under this arrangement the output of coal in the United Kingdom will be the smallest for years past. Sir Auckland Geddes, in his statement explaining the proposed rise of 6s. per ton, estimated that in the calendar year (1919) it would be 230,606,000 tons, as compared with 287,412,000 tons in 1913. This decrease of nearly 57,000,000 tons will be accentuated by a further 13,000,000 by the Sankey award and the seven-hour shift. What the country has to face is a shortage of 70,000,000 tons as compared with the last normal year. A very different prospect from what it was led to expect would open up to it after the war!"

The National Union.

The eleventh annual meeting of the South African National Union will be held at the Carlton Hotel on Thursday next, the 18th instant, at 3.30 p.m. All interested in the work of the society are invited.

* * * *

An Industrial Venture.

The balance sheet and directors' report presented at the first general meeting of the shareholders of The National Industrial Corporation of Africa, Ltd., has been issued. About two years ago, with a view to assisting financially industrial ventures in South Africa, the Industrial Development Co., Ltd., was formed with a capital of £100,000. This Company's funds have been fully absorbed in loans to, and investments in various concerns, and at the initiation of the National Bank the National Industrial Corporation of Africa, Ltd., has been created with £500,000 capital. The new Corporation has absorbed the first company, and will continue to work along the same lines as the latter, with, we trust, similar success. The aim of the institution is to assist in the development of industries. Mr. E. C. Reynolds, who is Chairman of the Board of Directors, in his remarks to the shareholders at their first ordinary general meeting, dwelt upon the great opportunity for industrial enterprise now before South Africa.

* * * *

Asbestos in Rhodesia.

The production of asbestos in Rhodesia is becoming increasingly important. The districts in which it is found are those in Bulawayo and Victoria. Production commenced in 1908, and has grown from 55 tons in that year to 8,574 tons in 1918. If to that we add the production for the first five months of the present year (2,940 tons), we have a total of 31,139 tons. The value of the 1918 output was £158,684, as against £189,820 in the previous year. The output showed a decrease of 988 tons, but was due to heavy rains in the early part of the year, to the inadequacy of shipping facilities and to the influenza epidemic. But for these drawbacks there would undoubtedly have been a considerably increased production. In the Bulawayo district Willoughby's Consolidated is a producer, from its Birthday mine; but the quantity at present is small. The greatest producer in that district is the Shabanie mine, of the Rhodesia and General Asbestos Corporation, whose May output of 260 tons realised £6,524. The same corporation, in the Victoria district, produced in May from its Gath deposit 167 tons, which realised £4,196, and the King asbestos mine produced 200 tons.

* * * *

New Consolidated Gold Fields.

The New Consolidated Gold Fields, Ltd., has been registered as a public company in London, with a capital of £4,500,000 in £1 shares. The objects are to enter into an agreement with the Consolidated Gold Fields of South Africa, Ltd., to acquire lands, mineral, oil-bearing and other properties, mining and other rights, to carry on all kinds of land development business, to prospect and explore territories and places in Africa or elsewhere, etc. The signatories to the memorandum of association (each signing for one share) are: Lord Brabourne, 43 Norfolk Square, W.; H. J. Porter, Wancom, Compton, Surrey, director of a public company; J. Bradshaw, Chase Cross, Romford, secretary to a public company; S. H. Nicholls, Temple Gardens, Golders Green, N.W. 4, C.A.; G. F. Hawkins, Marlow Common, Bucks., accountant; W. R. Franklin, Gonalston, Notts., secretary to a public company; M. M. Cunynghame, 40 Ladbroke Grove, W., secretary to a public company. Remuneration of directors, £3,000 per annum, or such larger sum as the company in general meeting may determine, divided between them as they may agree (chairman to receive not less than £600). A director need not be a member of the company nor hold any shares or stock therein. No notice of situation of registered office was filed at the time of incorporation.

* * * *

Selukwe Gold.

The report of the Selukwe Gold Mining Company for the year ended 31st March last states that the company holds 168 mining claims. The royalty on gold won from retreatment of tailings received during the year was £144, and the income from dividends, commission, discount, interest, etc., £1,751. After taking into account all Rhodesian and London expenses and the amount brought forward from last year the credit at profit and loss at 31st March was £793. The offer of the former tributor to reopen the old Tebekwe Mine previously referred to is still in abeyance owing to the prohibitive prices of mining material, stores, etc. The company retains a holding of 88,886 fully-paid £1 shares in the Kafue Copper Development Company. With regard to the arrangement whereby this company has, in conjunction with the Bechuanaland Exploration Company, undertaken to advance certain funds for the further development of the Hippo claims belonging to the Kafue Copper Development Company, the last-mentioned company reported that the work completed during the year was the sinking of the new main shaft to 120 feet. An experienced prospector was employed to obtain more accurate information and report with regard to the nature and extent of the deposits in the neighbourhood of the mine. The prospector was of opinion that the copper ore outcrop could be traced for at least four miles and that the lode was likely to improve with depth. Immediately the rainy season closed an engineer was despatched to the Hippo Mine to take over the management. There are stated to be standing in the mine 5,000 to 6,000 tons of ore ready for stoping, the values being estimated at 11½ to 15 per cent. copper and 1¼ to 4 dwts. gold. The directors propose to submit a resolution authorising them to apply to the Board of Trade to change the company's name to Selukwe Gold Mining and Finance Company, the object being to enlarge the scope of the company's operations by engaging in finance proposals which are at present not strictly within the company's field of operations.

* * * *

The Boom in Silver.

Latest advices regarding the reasons for the upward movement in silver, which is causing such a disturbance in Far Eastern exchanges, state that they are obvious, though the remedy is difficult to find. The prosperity of India and other Eastern countries as a result of the war has called for a considerable increase in the amount of currency in circulation, which, in the main, must be based upon silver. At the same time, largely as a result of the Mexican revolution, the world's production of the metal has fallen off to a very great extent. In 1911 it reached the record figure of 226,000,000 ounces, while for 1917 the total was no more than 167,000,000 ounces. Later figures are not available, but it is probable that there has been a further reduction, while the immediate outlook is not particularly promising. It is true that there are some signs of an improvement in the condition of affairs in Mexico, but, on the other hand, the output from that country was much smaller in 1917 than in 1916, and even at the best the recovery of the industry will be very slow. At the same time there has been a falling off lately in the United States production, owing to the restriction of the output from the copper mines, such as the Anaconda, of which silver is one of the by-products. The famous Canadian Cobalt mines also seem to be becoming less productive, and the threatened strike there does not make the immediate outlook any more hopeful. Another very important factor is that the Germans have to hand over to the Allies the whole of the gold reserves in the Reichsbank, and when her gold has gone and her credit is practically ruined, how can Germany ever hope to re-establish her financial position among the nations unless she has something with which to back her credit? Unable to obtain gold, Germany must inevitably turn to silver. Germany was responsible for the great fall in the value of silver which took place in 1871 through the demonetisation of her thalers, and equally she may quite possibly be responsible for the price of silver recovering to the level at which it stood previous to the Franco-Prussian war, if she is forced to go back to a silver standard. There are many other factors, which all have a bearing upon the position, and it does not appear likely that there will be any early increase in the world's production of silver.

The Demand for Diamonds.

Inquiries in leading circles in the diamond trade show that the position is much as previously reported. If anything, the demand for both rough and cut goods grows. Leading Continental buyers are still in London making strenuous endeavours to satisfy their requirements. Many have had to go away "hungry." This state of things (says the *Financial News*) is not surprising, when it is remembered that the producers are strictly limiting the output, and are not making the mistake of earlier years of over-supplying the market and adversely affecting the price. As we have pointed out from time to time, the demand for diamonds has extended largely as a result of the war. This was only in certain directions, for the export of precious stones was for a long time under supervision. New markets are being opened to sellers, and these demands, coupled with the difficulty of supplying clients of many years standing, keep the position remarkably strong. Diamonds have become a favourite form of investment. So far as bulk is concerned it is a case of *multum in parvo* and no one is going to predict any capital depreciation, for the gems are always saleable where the supply is so greatly inferior to the demand. The stones cut and polished at Mr. Bernard Oppenheimer's works at Brighton are eagerly sought after, and are disposed of as soon as finished. We understand that the second half of the factory is nearing completion, and when ready will give employment to some additional hundreds of legless soldiers and sailors.

* * * *

Toronto (Rhodesia) Syndicate.

The report of the Toronto (Rhodesia) Syndicate for the two years ended 31st December last states that the expenditure upon mining work and crushings amounted to £9,536. The value of the gold recovered was £7,239. Operations have been conducted under exceptional difficulties, arising firstly from the conditions prevailing in consequence of the European war; secondly, by reason of the unprecedentedly heavy rains during the latter part of 1917 and early in 1918; and thirdly, owing to the influenza epidemic, which affected South Africa perhaps more than any other part of the world, during the latter end of 1918, and generally owing to the scarcity of labour and the difficulty of obtaining supplies even at the enhanced prices ruling. Mr. Jeffreys, the company's general manager, has prepared a detailed report on the work that has been carried out at the mine since commencement of operations down to date, of which the following are extracts: Total footage of work to date, 6,663 ft. Of the above total 2,180 ft. has been driven on the ore body and exposed it for that length on the 100 and 200 ft. levels. Of the 2,180 ft. the reef has been driven on almost continuously at the 100 ft. level for a length of 1,100 ft. This work has proved the ore body to be from 4 ft. to 30 ft. in width with an average of over 8ft. The ore obtained from this development work from the entire length of 2,180 ft. has been crushed and treated for the purpose of testing its value. It was crushed partly at a Customs mill (Waterfall) and at the Toronto Company's own mill. Ore treated at Waterfall Mill, 7,500 tons (£10,109); at Toronto Mill (no slimes), 8,225 tons (£7,038); at Toronto in 1919, 540 tons (£524); total value, £17,671. Sands and slimes were treated at the Waterfall Mill. No slimes were treated at the Toronto mill, which accounts for the difference in the return of gold. The ore was of the same value as that sent to the Waterfall mill. The untreated slimes at the Toronto mill are valued at 12s. per ton, and are stacked for future treatment. Owing to the floods, etc., it was not possible to add to the ore reserves, which at the end of 1917 stood as follows: Estimated possible reserves, 53,143 tons (£48,952); less ore crushed during year, 3,620 tons (£3,160), and ore crushed in 1919, 540 tons (£624), leaving £45,258. Estimated value of untreated slimes, 4,000 tons at 12s. equals £2,400. It is proposed to increase the capital of the company, and it is confidently anticipated that with the funds to be provided the development of the property can be accelerated in a manner which it is hoped will secure a substantial return for the additional expenditure.

TOPICS OF THE WEEK.

THE BURDENS ON THE GOLD INDUSTRY.

NEVER was the crushing nature of the burdens on the gold mining industry more clearly emphasised than by the latest output returns. General Smuts promised in the Assembly during the week that an opportunity would be given, before the Special Session terminates, of discussing the economic situation of the country, and that, we take it, means the plight of the low-grade mines. How serious the position has now become may be seen from the figures of the August output, and from the facts given by Sir George Albu in his speech at the General Mining meeting, fully reported in this issue. Twelve mines were worked at a loss last month, and the increased taxation under the new Miners' Phthisis Act reduced the total working profits of the six groups by no less than £56,501 compared with July. Added to this there is a serious decline in the native labour supply, making the outlook still darker than before. It is generally believed that the increased burden on the mines due to the panic phthisis legislation of last session will more than offset any relief derivable from the increased price of gold. In the circumstances, the strongly-worded nature of the protest made by Sir George Albu is only too well justified. When the new Act was passed we gave in these columns a foretaste, in globular millions, of what the additional burden would mean to the mines. Sir George Albu now tells us authoritatively what it amounts to in practice. According to Sir George the provisions of the Act are, for the next five years at all events, at least four times as onerous as those of the previous Act. "I may say that we have just received the demands on the mines of our group for the first quarter's assessment under the new Act," said Sir George. "These vary from 100 to 800 per cent. in excess of the assessments for the previous quarter. We have loaned considerable amounts to our subsidiary companies, and have taken up large portions of their debenture issues, in the natural belief that we should be the prior creditors. Now Parliament steps in and makes laws of a retrospective character, providing that the compensation payable under these Phthisis Acts shall have priority over all our loans or debentures. One wonders whether any bond will be secure for a moment in a country where such legislation prevails, and I have no hesitation in saying that in my opinion neither debentures nor any other priority loans can any longer be regarded as recognised securities in the instance of gold mining companies on the Rand." In another part of his speech Sir George pointed out that the most amazing feature of the new Act was that it was put through Parliament in practically one day, without the Minister of Mines having taken the obvious step of ascertaining what its cost would be to the industry. In all previous instances the Government Actuary had been called in to give his calculations, but on this momentous occasion the Minister satisfied himself, and apparently satisfied the House also, with the estimates of two gentlemen who had no actuarial experience, and who frankly stated so in their report. The inevitable consequence was that whereas the Minister led Parliament to believe that the total cost of the Bill to the mining industry, for the first five years after being brought into effect, would be about £2,750,000, the evidence given recently by the Government Actuary before the Low-Grade Mines Commission was that the liability on the mines for the first five years is £5,100,000, or practically double the amount stated by the Minister! "If," concluded Sir George, "as seemed almost probable, one of the effects of the Act was that eventually only the richer mines were able to continue working, with the result that a large number of people were thrown out of employment, the responsibility for such a state of affairs must rest with Parliament, but especially with the Rand members of the House who, for the most part, actively assisted the passage of the Bill." Fortunately Parliament is sitting just when these facts are making the position desperate, and it is, perhaps, permissible to hope that the evil that Parliament has done to the industry it can yet even partly undo. It now depends upon the good sense and moral courage of the Government whether the country can still be saved from the impending economic catastrophe'

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SOME ASPECTS OF THE MODDER EAST.

The Question of Milling Plant—Development Values and Tonnages—A Feather in the Cap of the Central Mining—Complicated Finance—Is the Property Over-Capitalised ?

DEVELOPMENT of the Modderfontein East Company's property continues to proceed with the utmost dispatch, and the results secured up-to-date make it clear that the great Modder family will be increased by the addition of a productive young brother in the near future. Although one or two analytical critics have already attempted comparisons between the Modder East and other Far East Rand ventures, it is, in our opinion, too early to attempt close studies in the relative values of the youngest of the Corner House properties and of other propositions in this neighbourhood. And to base such comparisons on current share market valuations is certain to result in strange anomalies and financial contradictions. A close critic of relative intrinsic merits might, for instance, be tempted to point out that on a basis of a capital of a million and a half there is little difference between the present market valuations of New States and Modder Easts, although the latter company from a development point of view is probably four years ahead of the former and is already established as a profitable concern. Comparisons are, however, always odious, and the fact remains that both stocks are finding plenty of supporters at just under a fifty per cent. premium. In the course of time each purchase is pretty certain to prove a profitable one. For the time, however, we are concerned with the Modderfontein East only, its present development and financial aspects and the outlook for the future, and taking all facts and circumstances into consideration it is unquestionable that Modder East to-day has all the appearances of becoming an important gold producer and profit earner within the next eighteen months or two years. To have brought the Modderfontein East property to its present state of development, which amply justifies the ordering of the plant referred to in the directors' report, is an achievement which the Central Mining and Investment Company may well be proud of, having regard to the difficult circumstances of the War and the time that has elapsed since flotation. The Modder East property did not commence its career with too happy a reputation. Traditions were against the proposition rather than in its favour. Cloverfield had not proved a success under its former aegis, and the record at Rand Klip was not in the least encouraging. The lease area was more or less of a *terra incognita*, and there was no lack of critics who protested that beyond the eastern boundary of Modder B. there was little likelihood of a payable mine being established in this, the extreme north-eastern corner of the Witwatersrand. A dozen or more years ago there were similar pessimists who never could see a payable mine arising out of the Modder B. flotation and perhaps the recollection of that experience helped to induce the Central Mining Company to embark on their Modder East enterprise when economic conditions were by no means favourable to the development of new gold mines. To-day there must be well over a million tons of payable ore developed in the Modder East, and this tonnage is being rapidly augmented. Not only is the company increasing its tonnages of blocked-out ore each month, but there has been a most gratifying tendency for the value steadily to improve. In the first quarter of the year ended with June last the disclosures were 262 inch-dwts. In the next three months there improved to 276 inch-dwts. In the third quarter of the year 330 inch-dwts. were recorded, and in the last quarter, that is during April, May and June of this year, the average value was 344 inch-dwts. for 3,455 feet sampled. Since the end of June there has been a further substantial improvement in the width and value of reef disclosed in many sections of the property. And at the end of the current quarter the ore reserve position should show the recent appreciation in the price of the shares has been abundantly justified. It should be noted that up to date development has been confined to the lease area of 650 claims, and the Cloverfield section of 800 claims no operations having been conducted on the Rand Klip area. Even supposing Rand Klip yields not one single ton of payable ore—an altogether unlikely contingency—the Modder East Company will possess in its Cloverfield and Lease sections alone the makings of a mine of more than average size and life. The directors of the company recently announced their intention of proceeding with a reduction plant of 40,000 tons per month capacity. On such a basis the life would be an unusually long one, and this equipment will naturally enough be capable of extension to a very much larger capacity. The technical advisers of the company would probably desire to see the Modder East equipped on an all Nissen stamp basis of crushing capacity, but the directors are careful to point out that existing unsettled conditions do not make for rapidity in delivery and erection of a plant, much of which has to be imported. As an alternative the employment of an existing modern and erected, but presently idle, plant has been advocated, and in this respect both the Apex and Bantjes equipments have been spoken of. No official statement has, however, been made in regard to such a policy, and it is clear from the wording of the directors' paragraph in regard to the installation of a production plant that the Central Mining's technical advisers are in favour of the erection of a brand new and thoroughly modern plant, which we surmise will in so far as the primary crushing operations are concerned be of Nissen type.

The most discussed of all matters connected with the Modderfontein East is that of finance. Critics contend, and not without some reason, that the Modder East is going to transgress the first commandment of mining finance, which tersely asserts: " Thou shalt not be over-capitalised." Has the Modder East got too much in the way of capital " top hamper "? It would appear to have. But the savants should not be too harsh in their analytical wisdom. The Modder East has been brought to its present encouraging state during an exceptionally difficult period—a period of war and Treasury restrictions, costly supplies and dear labour. It is entirely a Home industry: it has not been financed by Europe as most pre-war ventures were financed. The original capital issue of the Modder East was £690,459.

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To this must be added 747,959 shares set aside in respect of the four- and three-year options. A few months ago, when the company's funds were exhausted, the shares were not a strong feature. The price of the stock fluctuated between nineteen and twenty-one shillings, and naturally enough the holders of the "red" and "blue" options had no inducement at that time to exercise their privileges in regard to taking up the shares. The first debenture issue of £200,000 was accordingly made, but despite its attractive features in regard to interest and conversion rights it was not fully subscribed for and the "stable" was saddled with £41,000 of it. But quite suddenly the development position took a marked turn for the better and shares, debentures and options commenced to appreciate in price. The subscribers to the first debenture issue were promised preferential participation in the second issue (£300,000), of which particulars recently have been announced in the Press, and the proceeds of which are required for the further development and equipment of the mine. At the moment of writing the original debenture issue is quoted at a hundred per cent. premium, so that it is highly improbable that applications will fall short of the next debenture issue. There were those who considered that the issue of these latter debentures was unnecessary and that the financial requirements of the company could be temporarily met within the House until the exercising of the options brought in three-quarters of a million. But as subscribers to the initial debentures were given an understanding in regard to participating in a second issue of convertible bonds "on the ground floor" a further £300,000 has been offered to subscribers of the first issue. Assuming that the options are all exercised (as they most certainly will be), the total capital of the Modder East Company will be £1,938,418, allowing for the conversion of debentures into shares. In some well-informed quarters it is contended that the Modder East Company under these schemes will posses more than sufficient capital and that a further readjustment of finances is inevitable. The accuracy of this view remains to be seen. Generally speaking, Rand equipments cost more, rather than less, than originally estimated, and in these days of high frieghts, rising costs of material and general economic topsy-turveydom, it is best to have an ample margin of money to draw on. But whether an eventual reduction of capital is necessary or not, one thing seems clear, and that is that the financing of the Modder East has led the Central Mining and Investment Company into deeper waters than they anticipated. They have, however, made a distinct success of the flotation despite great difficulties, and if the skeins of finance have become a trifle tangled the offence—if offence it be—is amply and abundantly condoned by the excellent state of affairs prevailing at the mine and by the fact that most people have made money out of Modder Easts through at least one of its several media of speculative investment.

ANSWERS TO CORRESPONDENTS.

All enquiries addressed to the Editor must bear the writer's name and full address. We cannot reply to enquiries by letter, but telegrams with replies prepaid will be answered. Correspondents are requested to write their names and pseudonyms distinctly.

"L. S."—(1) The mine is situated in the Barkly West district. (2) Care of the Johannesburg Consolidated Investment Co., Ltd. (3) An official statement will shortly be issued.

"Anxious."—(1) No. (2) 2½ per cent.

"Shareholder."—The exact percentage is printed in another part of this issue.

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WHAT THE GOVT. GETS FROM THE RICH FAR EAST MINES.

Valuable Record and Summary of the Exact Share of the Profits Taken by the State from the Modder Areas, Springs, Brakpan, West Springs, New States and Modder East Mines.

We are continually being asked by shareholders, actual and prospective, to repeat the facts regarding the shares accruing to the Government in the areas leased by it on the Far East Rand. The following data, summarized from the G.M.E.'s annual report, answer all these questions very concisely, and should be retained for future reference.

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The Government's interest is a share of the profits less an allowance to amortize capital expenditure, according to the following formulae:—$y = 5{\cdot}467 + 1{\cdot}06487\,x - \frac{53{\cdot}66}{x}$ when x is less than 36·1702 and y is less than 42·5; $y = 82{\cdot}5\ \frac{1446{\cdot}81}{x}$ when x is greater than 36·1702 and y is greater than 42·5; where x is the ratio of profit less amortization allowance to the value of the precious metals produced expressed as a percentage and y is the percentage of profit less amortization allowance payable to Government, provided that in no case shall the share payable to Government be less than 10·75 per cent. of such annual profit less amortization allowance. Period—Financial year ended 31st December, 1918:—Tonnage milled, 1,303,500; value of gold produced, £2,162,585; value of gold produced per ton milled, 33·181s.; sundry revenue, £1,391; working costs, £1,288,645; working costs per ton milled, 19·772s.; profits, £875,331; profits per ton milled, 13·430s.; profits less amortization allowance, £817,157; share of profits due to Government, £361,270; capital expenditure from inception to 31st December, 1918, £2,086,205.

BRAKPAN MINES, LTD.

The Government's interest is: (i.) during a period of five years from 1st January, 1917, five per cent. of the annual profit less amortization allowance; (ii.) thereafter a share of the annual profit less amortization allowance according to the following formula:—$y = 50\frac{1150}{x}$ where x is the ratio of profit less amortization allowance to the value of the precious metals produced expressed as a percentage and y is the percentage of profit less amortization allowance payable to Government, provided that in no case shall the share payable to Government be less than 12·5 per cent. of such annual profit less amortization allowance. Period—Financial year ended 31st December, 1918:—Tonnage milled, 617,100; value of gold produced, £1,097,747; value of gold produced per ton milled, 35·578s.; working costs, total, £799,358; working costs per ton milled, 25·907s.; profits, total, £298,389; profits per ton milled, 9·671s.; profits, less amortization allowance, £274,272; share of profits due to Government, £13,713. Capital expenditure during the year amounted to £127,046, of which the chief item was: Shaft sinking and equipment, £123,383.

SPRINGS MINES, LTD.

The Government's interest is:—(i.) during a period of five years from 1st January, 1918, five per cent. of the annual profit, less amortization allowance; (ii.) thereafter a share of the annual profit according to the following formula:—$y = 55 - \frac{1175}{x}$ where x is the ratio of profit less amortization allowance to the value of the precious metals produced expressed as a percentage, and y is the percentage of profit less amortization allowance payable to Government, provided that in no case shall the share payable to Government be less than 12·5 per cent. of such annual profit less amortization allowance. Period—Financial year ended 31st December, 1918:—Tonnage milled, 427,610; value of gold produced, £914,383; value of gold produced per ton milled, 42·767s.; working costs, total, £592,024; working costs per ton milled, 27·690s.; profits, total, £322,359; profits per ton milled, 15·077s.; profits, less amortization allowance, £288,268; share of profits due to Government, £14,413. Capital expenditure during the year amounted to £192,357, of which the chief item was:—Shaft sinking and equipment, £189,671.

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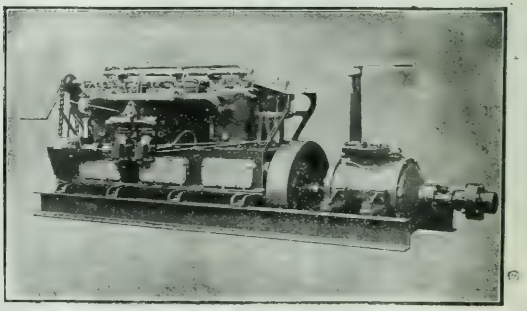

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SOUTH AFRICA'S OPPORTUNITY: OUR SPECIAL COAL NUMBER.

Advancement of the Industry—Prospects of South African Coal Export—Co-Operation of Colliery Owners Invited.

All arrangements have now been completed for the publication of a Special Coal Number of the *South African Mining and Engineering Journal* in November next. The supplement will be a weighty and informative publication, replete with illustrations, maps, diagrams and statistics dealing with every aspect of the South African coal trade. Its publication will, we confidently anticipate, mark the dawn of a new era in the history of South African industry. Hitherto the enormously valuable coal resources of South Africa have received very meagre attention. The glamour of our gold mines and the glitter of our diamond mines have tended to blind people to the value of the Union's coal measures; but nothing is more certain than this—that within the next few years there is going to be a tremendous development of South African coal fields. The demand for coal all over the world is unprecedented. The ravages of war have seriously disorganised the European coal industry. Many collieries in Western Europe have been ruined, and both in Europe and America the high prices of labour and materials have brought the cost of producing coal up to almost prohibitive rates. The whole world is looking for a new source of fuel where coal can be obtained at prices which are reasonable, and by far and away the largest deposits of coal which can be raised at low cost are those of the Union of South Africa. In the near future the rolling stock of the Union's railways will be augmented by the delivery of millions of pounds' worth of new locomotives and rolling stock and within the next year or two thousands of ships will be calling at South African and Portuguese East African ports for coal. Granted transport facilities, there is scarcely a country in the world to-day which would not benefit by purchasing South African coal. If we had the necessary railway and shipping facilities we could land South African coal at Newcastle at less cost to the consumer than the consumer pays for coal from his own North of England coalfields. South African coal is at last coming into its own and we shall spare no effort to make our Special Number worthy of the momentous industrial fact which it is going to establish and elucidate. With this object in view we have appointed a Special Commissioner and Mining Expert to visit and report on all the collieries in the Transvaal, Orange Free State and Vryheid areas, whilst the Mining Editor of this paper, Mr. Owen Letcher, F.R.G.S., etc., will report on the Natal collieries and the coaling facilities at the Port of Durban. Both our Commissioners will secure photographs of the collieries and will collaborate in the preparation of a complete map of the South African coal fields and collieries. Such a map does not exist to-day and it need hardly be stated that in this respect alone the Number will fill a long-expected want. Our representatives will investigate all matters connected with the collieries not only in regard to the nature of the coal seams, output, method of working, plant and equipment, economic features, etc., but also in regard to the prospects or achievements of each company in connection with the by-product industry, which is also an expanding and most important new branch of the mining industry. We hope to have the co-operation of all the chairmen of the collieries and their assistance in arranging transport for our special representatives from the nearest railway station to their collieries. We also desire them to furnish us with letters of introduction in favour of our Commissioners to their managers at the mines. We have decided to print 5,000 *extra* copies of this particular issue, and these will be distributed to every member of the House of Assembly and every member of the House of Commons; the balance will be sent to shipping firms, specially selected persons in the Argentine Republic, India, Australia and along the East Coast of Africa. In order to make the whole work a complete success it only rests now with the collieries themselves. It is quite possible that with the incomplete list of the mines published by the Government we may have overlooked some of the collieries, and it remains with these companies who have not received a letter from us to communicate with the Managing Director of this Journal, P.O. Box 963, who will be pleased to furnish full information. *The progress and value of any country is to be gauged in terms of that country's coal deposits. If you have any stake whatsoever in the Union of South Africa, you cannot afford to miss this Special Coal Supplement!*

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Notice No. 23, of 1919.

HEIDELBERG MUNICIPALITY.

TENDERS FOR ELECTRIC GENERATING PLANT.

TENDERS ARE HEREBY INVITED for the purchase of the complete plant, of which the Engine and Generator is still working, at the Municipal Power Station, comprising:—

One 25 K.W. National Gas Corporation Suction Gas Plant.
One Single Cylinder Premier Gas Engine, with Belt.
One 220-440 volts 3-wire A.E.G. D.C. Generator with Static Balancer.
One 18 H.P. 220 volts Booster, with Belt.
One Switchboard, complete with Generator Panel, Battery Panel, Battery Regulating Panels and Feeder Panel.

The above plant is being replaced by a larger one, and will be dismantled as soon as the new set is running.

Sealed tenders, marked on the cover "TENDER FOR GENERATOR PLANT," are to be addressed to and lodged with the Town Clerk, Municipal Offices, Heidelberg, T.P., not later than 12 o'clock (noon) on Wednesday, the 10th September, 1919.

Further information may be obtained from the Electrical Engineer.

The highest or any tender not necessarily accepted.

By Order,
W. A. ter HORST,
Town Clerk.

Municipal Offices, Heidelberg,
Transvaal, 21st August, 1919

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ORE BUYING DEPARTMENT,
SINGAPORE.

DEEP MINING TEMPERATURES ON THE RAND.

Interesting Description of the Methods of Solving the Heat Problem at the City Deep.

In connection with the address on "High Temperatures in Deep Mines," which Sir William Garforth delivered at a meeting of the Midland Institute of Mining Engineers last October, a contribution was made by Mr. E. H. Clifford, of Johannesburg, which was read at the annual meeting of the Institute at Sheffield on July 24.

Mr. Clifford wrote that he was not sufficiently familiar with the conditions of deep mining in England to be able to offer any comments on Sir William Garforth's suggestion, viz., the direct refrigeration of the air, but there was no doubt that the method would be effective for local cooling. The general cooling of an extensive mine would necessitate a very large installation, as the quantities of heat to be got rid of were considerable. Precisely the same problem had been met with on the Witwatersrand in a rather acute form, and it might be of interest to describe the method that had been put into use by the writer in the City Deep Mine, which was one of the largest and deepest mines of the Witwatersrand. The structure of the City Deep Mine was simple enough. The area was roughly rectangular—about 12,000 ft. long on the strike and 8,000 ft. on the dip. The reef along the northern boundary, which was the shallowest, lay at a depth of slightly more than 2,000 ft., and at the southern boundary the depth reached about 7,000 ft., the dip averaging between 35 and 40 deg., and the width (*i.e.*, the distance between roof and floor) of the stopes about 5 ft. The mine was operated by two rectangular timbered shafts about 4,000 ft. deep and 4,000 ft. apart. There was also near the northern boundary a ventilating shaft, 20 ft. diameter, and equipped with a Sirocco double-inlet fan of 400,000 cub-ft. per minute capacity, the two rectangular shafts being downcast. In addition, a new shaft was now being sunk near the southern boundary, designed to reach a depth of 7,000 ft. It was 20 ft. in diameter, and would be used as a main winding and downcast shaft. At the present time the workings, which were confined to the uppermost portion of the mine, extended over an area of approximately 10,000 ft. along the strike by 3,500 ft. on the dip, and the greatest vertical depth at present was 4,500 ft. On the Witwatersrand the temperature of the rocks increased at the rate of 4 deg. for every 1,000 ft. in depth, and the rock temperature at 4,500 ft. was 84 deg. This would not be at all serious were it not for the fact that the air, shortly after leaving the main intakes, very soon became saturated in consequence of regulations stipulating that all rock surfaces should be kept wet in order to prevent the dissemination of dust. A saturated air at a temperature of 84 deg. F. was scarcely supportable unless the air was in active motion, and this latter condition could not be maintained at every point, particularly in development ends. In this connection it might be mentioned that the katathermometer, designed by Dr. Leonard Hill, had been found most useful in translating the physiological temperature state of an atmosphere into a single numerical result, as this instrument not only took into consideration the temperature and humidity, but also the cooling effect due to motion of the air. They had therefore reached the limit on the City Deep, and had yet an additional 2,500 ft. to go, and were faced with the necessity of reducing the air temperature from between 95 and 100 deg. F. (which it would be at 7,000 ft.) to about 75 deg. F. The principle that was being relied upon was the heat-absorbing capacity of the ventilating current of air due to evaporation and to its specific heat. Local cooling near the bottom of downcast shafts was, of course, taking place everywhere, but it generally remained local cooling only, and in any case could have little or no effect on the temperature of distant parts of the mine, unless the total heat absorbed by the air current as a whole was greater than the heat supplied from all sources. In the City Deep this latter condition obtained at the present moment, and there was not the slightest difficulty with temperatures down to a depth of 4,500 ft., but whether the principle would be equally successful at 7,000 ft. remained to be seen. However, practical observations and careful inquiry into the physics of the problem rendered it quite probable that they would be successful. The air became warm after it had travelled some distance from the main intake, but, except in the case of long dead-ends, no difficulty had been found in keeping all the working places at a satisfactory temperature. Dead-ends would have to be cooled by a special ventilating pipe supplying dry air to the face, but the necessity for this had not yet become urgent, as the air at the face, where nearly all the work was done, was effectively cooled by the exhaust from the rock drills. The heat of the air in the mine came from the following sources: (1) The compression of the air in its way down the shaft. This was considerable; in fact, the temperature rise on this account was actually greater than the temperature rise of the rock due to depth. (2) The flow of heat from the rock mass to the air of the workings. This depended upon a great many factors, among them being (a) the conductivity of the rocks and the temperature difference between the rock and the air current; (b) the relation between the volume of the workings and the rock surface; and (c) the daily increment of surface resulting from mining. (3) Further sources of heat are water, the men working in the mine, the combustion of illuminants, explosives and electric power. A frequent source of heat supply, viz., chemical change of minerals, is not, in the case of the Witwatersrand, of any importance. To absorb this heat they were relying upon: (1) The specific heat of the air, and (2) the heat absorbed by its evaporative power. It was very fortunate that in the Transvaal the air during the greater part of the year

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was dry, the percentage of humidity ranging between 74 per cent. during the rainy season and about 36 per cent. during winter, and it was this fact which rendered the method practicable, and might possibly afford a complete solution of the difficulty. The capacity of the fan was, as previously stated, 400,000 cub. ft. per minute, and the average heat-absorbing power of this quantity of air was 1,700,000 calories per second. Of this amount one-fifth was due to the specific heat of the air and four-fifths due to evaporation. On account of the dynamic heating, they lost, in the deepest part of the mine, practically the whole of the heat-absorbing capacity resulting from the specific heat, but as the air rose to the shallower parts of the mine, some of this was returned. In the calculations the abstraction of 1,360,000 calories per second was all that was relied upon. The items under the heading (3) amounted to about 185,000 calories per second, leaving a balance of roughly 1,200,000 calories per second available for absorbing the heat from the rocks. Assuming that the mine was bounded by an infinite mass of rock, and assuming that the estimate of conductivity, which was based on experiments, of 0·0093 was correct, this quantity of heat was greater than the heat-flow from the rocks to an air current of a temperature of 75 deg. F. Under the present conditions, therefore, the mine would tend to become cooler as a whole, but the continuous increase in the extent of the mine was having the opposite tendency. The process was self-regulating to a considerable extent, because the heating of the air increased its evaporative power, and there was abundant moisture everywhere for the exercise of this power, and also in consequence of the dynamic cooling as the air travelled from the lower to the upper parts of the mine. It was important to keep the downcast shafts as dry as possible, in order to preserve as much evaporative capacity as possible for use in the distant parts of the mine. In practice, this led to a little difficulty in controlling the temperature, as the air was apt to become too cold just after it left the main intake if there was an abundant supply of moisture, and, on the other hand, it became too hot where the current was sluggish. Control was generally effected without much difficulty in either case by regulating the quantity of the air and rstricting the supply of moisture. The dynamic cooling admitted of a very simple type of ventilating scheme. All that was necessary, so far as the temperature was concerned, was to keep the downcast shafts dry and bring the main supply of fresh air to the deepest part of the mine. If its condition was made satisfactory at this point, it was not likely to become unsatisfactory higher up in the mine. A further effect of the dynamic fall in temperature was to bring about a condensation of moisture, making the air extremely foggy in the upper parts of the mine, and it had this incidental and unlooked-for advantage, that the air became completely cleared of dust particles.

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Koodoo Diamonds.

The following statement has been issued by the directors regarding the Koodoo Diamond Syndicate:—Cash in hand, £1,421; cash on call, £1,455; S.W. diamond shares, 4,000; reserve shares, 3,500. Negotiations are now proceeding for the acquisition of an extensive and promising property on which good looking yellow ground and diamonds have been found. As soon as all the documents in respect of this property are in order, active prospecting operations will be taken in hand. The syndicate has carried out extensive prospecting operations and has expended considerable sums in the payment of options and other expenses, incidental to the flotation of such ventures.

Crown Diamonds.

The secretary of the Crown Diamond Mining and Exploration Co., Ltd., writes: We have to inform you that the 293½ carats of diamonds recently recovered from the test washing at this company's mine have now been valued at 47s. 9½d. per carat. From estimates which have been prepared by the company's technical advisers, there seems every reason to expect that if the company can continue to realise so high a figure for its product it will pay to start up mining operations. The Board has considered this matter very carefully, and in view of the facts as stated has arranged to undertake mining from the open workings. It will, of course, be necessary to carry out certain preliminary work, such as pumping, before a start can be made. It is estimated that these preparations will take about a month to complete. The new development programme will also be proceeded with simultaneously. The present shaft will be sunk a further 100 feet and drives will be made to various sections of the mine with a view to carrying out a further test at increased depth.

Rhodesian Labour Affected by Influenza.

It is reported from Salisbury that 180 cases of influenza have occurred on the Rezende Mine at Penhalonga. The outbreak is confined chiefly to natives, although three Europeans are also down. Up to date two natives have died, but the outbreak is stated to be of a mild type and the authorities are not alarmed. The "boys" attacked by the disease are all boys from the north who passed through Inyanga, where two or three cases of influenza occurred a few days ago. A more serious position is revealed by a statement by the Rhodesian Native Labour Bureau, who have been informed that all recruiting operations must cease in Northern Rhodesia on account of influenza. This is a great blow to the mining and other industries, for with the exception of Portuguese territory, from which comparatively few natives are coming forward, Northern Rhodesia is the only territory where the Bureau is able to carry on recruiting. It is suggested that the epidemic has spread from the Wankie Colliery, where the first recrudescence of the disease occurred in Rhodesia, to Livingstone, and thence to the Bureau compound, for only northern natives are affected.

THE AUGUST OUTPUT IN DETAIL.

Native Labour Shortage and Peace Holidays Caused Considerable Decrease.

The Transvaal gold output for August was declared on Wednesday. The aggregate figures are:

Total output	706,669 ozs.
Value	£3,001,739
Decrease	18,828 ozs.
Value	£79,974
Witwatersrand	686,717 ozs.
Value	£2,916,988
Decrease	18,806 ozs.
Value	£79,881
Outside districts	19,952 ozs.
Value	£84,751
Decrease	22 ozs.
Value	£93
Stamps	8,139
Decrease	83

COMPANY RETURNS.

WITWATERSRAND.

	Value.	Increase.	Decrease.
	£	£	£
Aurora West	16,579	2,884	—
Bantjes	763	—	104
Brakpan	89,283	—	4,677
City and Suburban	27,028	—	4,299
City Deep	103,318	—	4,791
Cons. Langlaagte	53,810	—	1,580
Cons. Main Reef	75,270	875	—
Crown Mines	240,499	—	3,159
Durban Deep	32,950	21,439	—
East Rand Proprietary ...	153,394	2,387	—
Ferreira Deep	51,567	403	—
Geduld Proprietary	64,914	—	586
Geldenhuis	56,316	—	2,209
Government Areas	197,626	—	14,494
Jupiter	26,132	—	1,869
Knight Central	31,799	510	—
Knights Deep	74,675	—	2,549
Meyer and Charlton... ...	41,649	565	—
Modder B.	114,714	—	8,632
Modder Deep	91,700	—	4,142
New Goch	12,633	—	1,758
New Heriot	14,561	—	2,116
New Kleinfontein	70,521	1,406	
New Modder	162,254	—	12,735
New Primrose	18,082	—	557
Princess	27,908	685	—
Robinson Deep	77,971		705
Roodepoort United	20,890	—	1,831
Rose Deep	60,624	—	1,430
Simmer and Jack	58,215	—	2,540
Simmer Deep	50,416	—	744
Springs Mines	65,772	—	514
Van Ryn Estate	32,440	—	2,073
Van Ryn Deep	109,838	1,848	—
Village Main Reef	25,079	—	904
West Rand Consolidated...	38,879	—	670
Wolhuter	34,831	—	2,226
Langlaagte Estate	48,603	—	1,677
Luipaardsvlei	20,440	—	1,869
New Unified	11,966	—	51
Randfontein	171,485		6,491
Robinson	42,384	—	1,478
Village Deep	64,608	—	153
Witwatersrand	38,502	—	3,138
Wit. Deep	35,643		1,231
Nourse Mines	50,153		3,984
Miscellaneous	8,274	—	5,912

OUTSIDE DISTRICTS.

	Value.	Increase.	Decrease.
	£	£	£
Sub Nigel	27,912	-	599
Glynn's Lydenburg	5,471	- -	1,525
Barrett	718	—	132
T.G.M.E.	26,378	—	243
Miscellaneous	24,272	2,406	—

GROUP PROFITS.

	July.	August.
Central Mining	£267,893	£254,647
Barnato Group	194,398	170,255
Union Corporation . .	77,881	72,172
Cons. Mines Selection	41,003	40,442
General Mining	25,130	20,997
Gold Fields	26,166	17,457
Totals	£632,471	£575,970

CORRESPONDENCE AND DISCUSSION.

Colonial Soldiers and British Income Tax.

To the Editor, *S.A. Mining and Engineering Journal.*

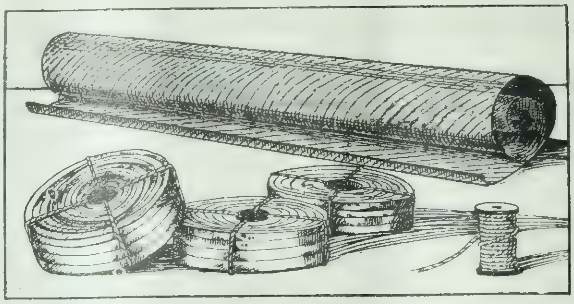
Sir,—It may not be generally known by Colonial soldiers who have returned home from the war that they have become entitled to greater rights in respect of the British income tax than they enjoyed prior to joining the Imperial Forces. They were entitled to a refund of the tax deducted in the United Kingdom from their "Foreign and Colonial Dividends" only: but owing to being in the service of the Crown they have become entitled to the usual abatements, allowances and reliefs which they would enjoy if resident in the Mother Country. For example, from an income derived from British sources only, the relief for the three years ended 5th April, 1919, amounts in cash to £262 10s. upon a £1,000 income and £104 upon a £130 income. If the above income consists of "Foreign and Colonial Dividends," Colonial residents would be entitled to a refund of the whole of the taxes deducted upon the £1,000 income, namely £800: and the same upon the £130 income, namely £104, which is the total tax deducted. The following is a more complicated case and is restricted to one year ending on the same date:—British income, £400; Foreign and Colonial dividends, £100; Colonial income from earnings, £100; total, £600. Allowances: Wife, £25; two children, £50; life assurance, £25; total, £100; abatement, £100; total, £200. Claim: British income, £400; abatements and allowances, £200 at 6s. equals £60; unearned income, relief on £200 at 2s. 3d. equals £22 10s.; total, £82 10s.; refund of tax on Foreign and Colonial dividends, £100 at 6s. equals £30; total, £112 10s. There are other details too intricate to deal with in this general conspectus, but these I should be happy to supply on hearing from any interested reader.—Yours, etc.,

W. R. FAIRBROTHER,
Income Tax Specialist.

67-68, Cheapside,
London, E.C. 2, England

Alcohol and Efficiency.

At a public meeting held on Wednesday night, to advocate prohibition, Dr. Orenstein delivered an important address on alcohol and efficiency. It is to be hoped that the address will be published in full by the Safety First Committee.



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"BARTLEITE" JOINTING

is stocked in thicknesses of 1-32, 1-16 and 1-8 inches. This high quality jointing does not adhere to the metal, and it can be used over and over again. Reliable and durable to that extent which makes it the most economical and satisfying of all jointings, "Bartleite" stands in a class by itself, unequalled, unapproached as a jointing, for high temperatures and super-heated steam.

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THE AUGUST GOLD OUTPUT: GROUP RETURNS.

Central Mining/Rand Mines Group.

The following are the results of crushing operations of the Central Mining/Rand Mines companies for the month of August:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Total Fine Ozs.	Total Estimated Profit.	Estimated Working Costs per Ton.
City Deep	A154	10	55,800	24,323	£26,247	27/ 2
Cons. Main Reef	220	6	47,800	17,720	9,485	27/ 1
Crown Mines ...	660	26	176,000	56,523	50,811	21/ 2
Dur. Rood. Dp.	100	3	25,000	7,757	*833	26 7
East Rand Prop.	440	19	125,000	36,111	4,014	23/ 7
Ferreira Deep ...	160	7	34,400	12,140	7,221	25/ 5
Geldenhuis Deep	300	7	45,400	13,258	3,366	23/ 3
Knight Central ..	120	3	22,400	7,486	*398	28 5
Modder B. ...	B104	8	53,500	27,006	54,020	22 6
New Modder ...	C236	15	70,000	38,198	82,396	22/ 3
Nourse Mines ...	180	5	38,450	11,807	*1,934	26/ 9
Robinson	180	6	39,600	9,978	2,608	19/10
Rose Deep	300	7	51,700	14,272	11,148	19 0
Village Main Rt.	130	4	17,900	5,904	2,005	25 4
Wolhuter	120	4	29,700	8,200	2,027	21/ 9
Village Deep ...	180	7	42,800	15,210	2,464	28/ 9
Tls. & Averages	3,584	137	875,450	305,893	£254,647	23/ 6

A Includes 4 Nissen stamps. B Includes 24 Nissen stamps. C Includes 56 Nissen stamps.

* Loss.

Durban Roodepoort Deep.—Yield abnormally low.

General.—Operations generally have been adversely affected by insufficiency of native labour. Tonnages reduced by Peace Celebration holidays. The companies have received assessments from the Miners' Phthisis Board under the new Act for the quarter commencing 1st August, 1919, under which largely increased compensation is payable. The above-mentioned results for August are arrived at after charging working costs with the month's proportion of assessment. The following shows the increase in assessment for the month of August as compared with that for July under the previous Acts, namely:—

	August, 1919. Portion of Assessment under new Act. £.	July, 1919. Portion of Assessment under old Acts. £.	Monthly Increase. £.
City Deep	£2,810	£848	£1,962
Consolidated Main Reef	1,812	697	1,115
Crown Mines	5,377	2,081	3,296
Durban Roodepoort Deep	800	427	373
East Rand Proprietary...	3,492	1,670	1,822
Ferreira Deep	1,639	490	1,149
Geldenhuis Deep	1,457	558	899
Knight Central	825	282	543
Moddertontein B. ...	2,487	664	1,823
New Modderfontein ..	3,502	738	2,764
Nourse Mines	1,877	578	1,299
Robinson	653	418	235
Rose Deep	1,196	440	756
Village Main Reef ...	848	216	632
Wolhuter	1,152	347	805
Village Deep	1,379	718	661
	£31,306	£11,172	£20,134

P.O. Box 3807.

ROCKWOOD PRESSED STEEL UNIONS

H. ALERS HANKEY - - - Sole Agent.

Union Corporation.

Results of operations on the producing mines of this group for the month of August:—

Company	Stamps.	Tons Crushed.	Total Revenue.	Revenue per ton.
Geduld Proprietary	100	42,800	£65,254	30/ 6
Modder Deep Levels ...	70	41,300	91,491	44/ 4
Princess Estate	60	20,000	28,124	28 1
Totals	230	104,100	£184,869	

Company.	Costs. Total.	Costs. Per Ton.	Profit. Total.	Profit. Per Ton
Geduld Proprietary ...	£44,284	20/ 8	£20,970	9 10
Modder Deep Levels ..	39,648	19 3	51,843	25 1
Princess Estate	28,765	28 9	*641	0 8
Totals	£112,697	—	£72,172	—

* Loss.

The above working costs include the monthly proportion of the assessment under the new Miners' Phthisis Act. The costs per ton milled are as follows:—Geduld, 6·9d.; Modder Deep, 10·5d.; and Princess, 4·5d. The month's results were further affected by the Peace Celebration holidays.

Transvaal G.M. Estates.

The following are the particulars of this company's output for the month of August, 1919: Central Mines: Tons crushed, 12,700, yielding 4,635 fine ozs. Elandsdrift Mine: Tons crushed, 1,280, yielding 898 fine ozs. Vaalhoek Mine: Tons crushed, 1,900, yielding 677 fine ozs. Estimated value of month's output, £26,140. Estimated profit for the month, £5,712.

THE
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HEAD OFFICE, MONTREAL.

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68, William Street.
VLADIVOSTOK,
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Collections made. Drafts sold.
Bills of Exchange purchased. Trade Enquiries effected.

510 BRANCHES IN CANADA AND NEWFOUNDLAND, ALSO
66 FOREIGN BRANCHES.

CUBA—Havana (5 Branches), Antilla, Banes, Bayamo, Caibarien, Camaguey, Cardenas, Ciego de Avila, Cienfuegos, Cueto, Florida, Guantanamo, Jatibonico, La Maya, Manzanillo, Matanzas, Moron, Nuevitas, Palma Soriano, Pinar del Rio, Puerto Padre, Sagua la Grande, Sancti Spiritus, Santa Clara and Santiago de Cuba.
PORTO RICO San Juan, Mayaguez and Ponce. COSTA RICA—San José.
DOMINICAN REPUBLIC—S. Domingo, Puerto Plata, Sanchez, S. Pedro de Macoris and Santiago de los Caballeros.
MARTINIQUE Fort de France.
GUADELOUPE—Pointe-à-Pitre and Basse Terre.
VENEZUELA—Caracas, Ciudad Bolivar, Maracaibo and Puerto Cabello.
BRITISH WEST INDIES.
Antigua—St. John's. Bahamas—Nassau.
Barbados—Bridgetown and Speightstown. Dominica - Roseau.
Grenada St. George's. Jamaica—Kingston. Montserrat Plymouth.
Nevis - Charlestown. St. Kitts—Basseterre. Tobago Scarborough.
Trinidad—Port of Spain and San Fernando.
BRITISH GUIANA—Georgetown, New Amsterdam & Rose Hall (Corentyne).
BRITISH HONDURAS—Belize.

Affiliated in France:
THE ROYAL BANK OF CANADA (FRANCE),
28, Rue du Quatre-Septembre, PARIS.

Correspondents in Canada and West Indies for the NATIONAL BANK OF SOUTH AFRICA.

Capital Paid up and Reserves $31,000,000
Total Assets - - - - $430,000,000

Albu Group.

The following is information regarding the August operations of the producing mines of this group:

Company	Tons Crushed.	Cost.	Cost per Ton.	Total Revenue.	Profit.
Aurora West ...	15,000	£16,628	22·17	£16,475	*£153
Meyer & Charl	15,000	17,536	23·38	41,039	23,503
New Goch ...	14,780	14,564	19·71	11,983	*2,581
Roodepoort Un.	23,000	25,899	22·52	20,885	*5,014
Van Ryn Est...	29,200	27,760	19·01	32,288	4,528
West Rand Cn	31,150	38,120	24·47	38,834	714
	128,130	£140,507	21·93	£161,504	£28,715
				Less Losses	£7,748
					£20,997

* Loss.

The heavy charges levied under the new Miners' Phthisis Act, and the declaration of a holiday on full pay during the Peace Celebrations, seriously affected the results obtained from most mines of the group, notably the New Goch and Roodepoort United.

Van Ryn.—The small tonnage crushed is due to shortage of native labour and to a breakdown of the No. 2 shaft hoist, which suspended hoisting from the western section of the mine for four days.

Consolidated Mines Selection Group.

The following are the results of operations for the month of August, 1919:

	Stamps Working.	Tons Milled.	Working Costs per Ton Milled
Brakpan Mines ..	110	46,700	26/ 5·487
Springs Mines ...	80	37,350	27/ 4·876
Totals and averages ...	190	84,050	26/10·548

	Value of Gold declared.	Yield per Ton.	Working Profit.	Working Profit per Ton.
Brakpan Mines ..	£87,805	37/ 7·247	£26,027	11/ 1·760
Springs Mines ..	65,596	35/ 1·502	14,415	7/ 8·626
Totals & averages	£153,401	36/ 6·028	£40,442	9/ 7·480

Brakpan.—Added to gold reserve, 225 fine ozs.; total reserve at date, 7,724 fine ozs. The Miners' Phthisis Act, 1919, came into operation as from the 1st August, and involved an increased charge to working costs. The company's contribution for the three months ending 31st October, is at the rate of £2,000 per month, which is an increase of £1,322 per month, based on the average contribution for the previous six months.

Springs.—The Miners' Phthisis Act, 1919, came into operation as from the 1st August, and involved an increased charge to working costs. The company's contribution for the three months ending 31st October is at the rate of £1,349 per month, which is an increase of £775 per month based on the average contribution for the previous six months.

Witwatersrand Deep.

The following are the results of operations for the month of August, 1919: Tons milled, 29,700 tons; running time, 27 days; gold recovered, 8,391 fine ozs.; working revenue, £35,194, or 23s. 8d. per ton; working costs, £37,347, or 25s. 1d. per ton; working loss, £2,153, or 1s. 5d. per ton. The repairs to the east shaft, and the installation of the ventilation fan for the south incline have now been completed. Mr. David Thomas Morton (the technical adviser to the Board) has now been appointed acting manager in place of Mr. James Johns, who is on leave through ill-health.

Barnato Group.

The results of operations of the Barnato group for August are as follow:—

Mine.	Stamps.	Tons Crushed.	Revenue from Gold
Consolidated Langlaagte ...	100	40,000	£53,839
Government Areas	180	107,000	197,627
Langlaagte Estate	200	40,060	48,603
New Primrose	100	18,000	18,083
New Unified	60	11,300	11,966
Randfontein Central	600	146,200	171,483
Van Ryn Deep	90	47,150	109,839
Witwatersrand	215	30,700	38,504
Totals and averages ...	1545	440,410	£649,944
July totals	1573	486,200	£676,085

Mine.	Total Working Costs.	Working Costs per Ton Milled. Shillings.	Gross Profit including Sundry Revenue.
Consolidated Langlaagte ...	£43,987	21·994	£10,120
Government Areas	116,494	21·775	81,701
Langlaagte Estate	43,097	21·516	5,681
New Primrose	16,131	17·923	2,018
New Unified	10,417	18·438	1,582
Randfontein Central ...	162,220	22·192	10,136
Van Ryn Deep	53,315	22·615	57,053
Witwatersrand	37,999	24·755	1,964
Totals and averages ...	£483,660	20·196	£170,255
July totals	£486,207	20·000	£194,398

Monthly Gross Profit, 1919.—January, £162,943; February, £154,054; March, £179,310; April, £180,785; May, £190,416; June, £184,687; July, £194,398; August, £170,255.

Miners' Phthisis Assessment under new Act, included in working costs, per ton milled: Cons. Langlaagte, 9·290d.; Government Areas, 3·618d.; Langlaagte Estate, 7·127d.; New Primrose, 5·082d.; New Unified, 5·436d.; Randfontein Central, 7·536d.; Van Ryn Deep, 12·003d.; Witwatersrand, 7·768d.

Note.—Working costs include assessment under new Phthisis Act, amounting to £13,200, as compared with £3,800 under old Act.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of August of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared, Fine Ozs	Total Profit
Simmer and Jack ...	320	7	56,900	13,705	£3,895
Robinson Deep	150	9	53,500	17,434	9,279
Knights Deep	400	11	91,600	17,580	1,537
Simmer Deep	220	10	48,600	11,869	*1,860
Jupiter	80	5	25,000	6,152	*2,046
Sub Nigel	30	2	10,100	6,571	6,652
Totals	1,200	44	285,700	73,311	£17,457

Gold in reserve.—Simmer and Jack, 575 ozs.; Robinson Deep, 1,968 ozs.; Knights Deep, 478 ozs.; Sub Nigel, 3,090 ozs.; total, 6,111 ozs.

Glynn's Lydenburg.

The following are the particulars of this company's output for the month of August, 1919: Tons crushed, 2,950; total yield, 1,288 fine ozs.; estimated value of month's output, £5,396; estimated profit for month, £334. Low tonnage entirely due to shortage of native labour.

THE WEEK IN THE SHAREMARKET.

Firm with Improving Tendency—Buying from London—Far Easterns in Demand—Diamonds Active.

THE market closed firm on Thursday evening with a broadening and improving tendency. Buying from London is the immediate cause of the improvement, and the effect is seen in higher quotations almost all down the list. Far East stocks are, of course, the favourites, and diamonds are also sharing in the demand. The features of the call on Thursday were: New Modders at £28 10s. sales; Modder Deeps at 45s. sales and buyers; State Mines at 94s. 6d. sales; Gedulds, 9d. higher at 53s. and 53s. 6d. sales; Anglo-Americans 6d. up at 29s. 9d. sales and buyers; Langlaagte up 1s. at 21s. buyers; Modder Easts 1s. 1½d. better at 29s. 6d. and 29s. 4½d. sales; the three-year and four-year options about 3d. to 4d. each, and the debentures £12 higher at £212 10s. and £212 sales. Sub Nigels were higher at 22s. sales; Springs 9d. better at 57s. sales and buyers; T.G.M. Estates 6d. at 14s. and 14s. 6d. sales; West Springs 9d. at 26s. 6d. sales; and Pullingers (West Rand Estates) 1s. 6d. up at 6s. 3d. to 7s. sales. The market improved as the day went on and closed firm. Fluctuations for the week were as follows:—

	Fri. 5	Sat. 6	Mon. 8	Tues. 9	Wed. 10	Thurs. 11
African Farms	14 6	14 3*	14 3*	14 6*	14 9*	14 9
Anglo-Amer. Corp.	27 60	28 6	28 6	29 0	29 3	29 9
Apex Mines	7 6	—	7 2*	7 2*	7 3*	7 3*
Aurora Wests	8 3*	—	—	8 0*	8 0	9 0†
Bantjes Con.	3 1	3 1*	3 1*	3 1*	3 1*	3 1
Brakpan Mines ...	68 0*	68 6*	69 6*	70 0*	71 0*	71 0*
Brick and Potteries	4 6*	4 6*	—	5 6*	4 6*	4 6*
British South Africa	22 6†	—	—	—	22 6†	—
Bushveld Tins	2 1	2 5	2 5	2 4	2 5	2 3
Cassel Coals	32 6é	32 6*	—	32 6	32 6*	32 6*
City and Suburbans	7 1*	—	7 3	7 3	7 0*	7 3
City Deeps	58 0*	57 6*	57 0*	59 0	58 0†	56 3*
Clydesdale Collieries	25 0	25 6	—	25 0*	25 0*	25 6
Con. Investments ...	30 *	30 0*	31 3*	31 3*	31 3*	—
Con Langlaagtes ...	19 0*	19 0*	19 0*	20 0	20 0	21 0*
Con. Main Reefs ...	12 7½	12 8	12 3*	12 6	12 3*	12 3
Con. Mines Selection	25 9	26 0†	26 0†	26 0	26 0	26 0
Coronation Col.	62 6*	65 0*	65 0*	—	—	—
Corn. Freeholds ...	2 1*	2 1	2 0*	1 10	1 1*	1 4*
Corn. Syndicates ...	4 0*	—	4 0*	4 0*	—	—
Crown Dia.	9 3	10 6	10 9	13 3	12 7*	12 6*
Crown Mines	68 0*	48 0*	52 6	50 0*	—	—
Daggafontein Mines	24 9	24 9	25 1½	24 9	24 9	24 10½
East Rand Coals ...	2 10*	2 9*	2 9*	2 10	2 10*	2 10*
East Rand Deeps ...	0 11*	0 11*	0 11*	1 0	0 11*	1 0
E.R. Minings	23 0*	22 0*	—	25 0†	21 9*	23 3
E.R. Props	5 10	5 6	5 3*	5 3a	5 6	5 6*
E.R. Debentures ...	£65*	£70†	£65*	£65*	£65*	£70†
Ferreira Deeps	8 0*	7 6*	—	—	—	—
Frank Smith Dia. ...	5 2*	5 3	5 3	5 5	5 5*	5 7
Geduld Props.	51 6	52 0	51 6*	52 6	52 9a	53 6
Geldenhuis Deep ...	7 6*	—	—	—	—	7 9*
Ginsbergs	1 6*	—	1 9*	—	—	—
Glencairns	1 0*	1 0*	1 0*	1 0*	1 0*	1 0*
Glencoe Col.	6 0*	6 6*	6 3*	—	6 0*	6 3*
Glynn's Lydenburgs	18 0*	18 0*	18 0*	18 0*	18 0*	18 0*
Gov. Areas	92 3	91 6	91 9	92 3	92 3	94 6
Jhb. Bd. of Exec..	32 6*	32 6*	32 6*	—	32 6*	32 6*
Jupiters	4 6	5 0	4 9*	4 9*	4 9	4 6*
Klerksdorp Props. ...	1 7*	1 6*	1 7*	1 9	1 7*	1 8*
Knight Centrals ..	—	6 6*	6 5*	6 6	6 3	6 1
Knights Deep	8 6†	8 6†			8 0†	
Lace Props....	19 6	19 6	19 6	20 0	20 3†	—
Leeuwpoort Tins ...	29 3*	29 3*	29 9	30 9	31 0	30 9
Lydenburg Farms ...	8 4*	8 5	8 5	8 4*	8 5*	8 5*
Meyer & Charltons...	90 0†	87 6*	90 0*	88 0*	95 0†	95 0†
Middelvlei Est.	2 6†	2 4†	2 6†	—	2 4†	
Modder B.'s . ..	171 0a	170 0*	172 6	173 6	173 0	173 0*
Modder Deeps... ...	44 9	44 9	45 3	44 6	44 9	45 0
Modder Easts	28 7½	28 9	28 4½	28 9	28 3	29 4½
Do. Options (3 yrs.)	9 5	9 9	9 10	9 8	9 6	
Do. Options (4 yrs.)	11 9	11 10	11 9	11 7	11 6	11 11
Hume Pipes	27 0*	27 0	27 0†	26 0	25 6	25 6
Langlaagte Estates .	18 6*	18 6*	—	—	—	—
Natal Nav. Col. ...	24 0é	24 0*	—	24 0	—	24 0*
New Boksburgs ...	—	1 3*	1 6*	1 3*	1 6*	1 6*
New Eland Dia.	27 6*	28 0*	27 9*	30 0	29 9†	28 6*
New Era Cons. .	11 3	11 0	11 3*	11 3*	11 6	11 6
New Geduld Deeps	5 8	5 8	5 8	5 9*	5 10*	5 11
New Heriots	9 0†	7 6	8 0†	8 3*	9 0†	9 0†
New Kleinfonteins ...	11 0½	11 0	10 9*	11 6	11 0	11 0
New Modderfontn	£27¼		£27¾	£28/10	£28/10*	£28 10
New Unifieds	3 3*	–	3 3*	4 0†	4 0†	3 3*
Nigels	6 9*	7 0	6 6*	6 6*	—	—
Nourse Mines	13 6*	13 3	14 0†	14 0†	14 0†	12 6*
New State Areas ...	29 3*	29 9	29 9†	30 0	30 6	30 0
Premier Def.	152 6†	—		152 6†	—	150 0†
Pretoria Cements ...	86 0	86 6	85 6*	85 0*	84 0	86 6
Princess Estates ...	2 3	2 3	2 2*	2 3*	2 3*	2 6†
Rand Collieries ...	3 3*	3 3*	3 6*	3 6*	3 6*	3 9†
Rand Nucleus ...	1 10*	1 11*	2 0	1 11*	1 11*	1 10*
Rand Select Corp....	75 0*		74 0*	76 0*	75 6*	75 6
Randfontein Deeps	5 8*	5 11	5 6*	6 0	5 10*	5 11*
Randfontein Est. ...	19 9	20 0	22 0	22 3	21 9	21 6
Roberts Victors ...	12 0*	13 0†	13 0†	12 6†	12 0*	10 0*
Rooibergs	4 0	5 0*	5 3*	6 0*	6 0	6 0
Roodepoort Uniteds		-	2 6*	—	—	2 9*
Rose Deeps	-		–		8 0*	
Ryan Nigels	—	3 9*	3 9*	3 9*	4 0*	—
Shebas	2 6†	2 6†	2 3†	2 3†	2 3†	2 6†
Simmer and Jacks ...	–	—		5 6*	5 6†	—
Simmer Deeps	2 3	2 3*	2 3*	2 4	2 1*	2 0*
S.A. Breweries ..	35 0*	36 0*	35 0*	35 0*	37 0*	—
S.A. Lands...	6 1*	6 0*	6 3	6 3	6 2*	6 1*
Spring Mines	55 0	54 6	56 3	57 3	56 3	57 0
Sub Nigels ...	22 6	22 9		22 3	—	22 0
Swaziland Tins	18 0†		18 0†	18 0†	18 0†	—
S. Van Ryn ..	8 9*	8 9*	8 7	8 9	8 9	9 0
S.A. Alkali	25 6	27 6	27 6	27 6†	25 6*	26 0
Trans. G.M. Est. ...	13 9*	14 0	13 6*	14 0	14 0*	14 6
Tweefontein Col. ...	25 0*	—	25 0*	—	25 0*	25 0*
Tudors	1 2	1 2	—	1 2*	1 3	1 2
Union 5 per cent....	—	£106¼	£104¼	£104	£104	£104
Van Ryn Deeps ...	76 0	76 0	75 9	76 6a	76 6	76 6
Van Dyks	—	2 3*	—	–	2 3*	2 0*
Village Deeps	15 6†		15 6†	15 6†	15 6†	14 6
Welgedachts	21 0*	-	30 0†	—		22 6*
Western Rand Est....	5 3*	5 3*	—	5 6	5 6*	7 0
Witbank Collieries	60 0*	60 0*		—	—	65 0*
Witwatersrands ...	19 0†	17 0*	19 0	19 3†	17 0*	17 0*
Wit. Deeps	11 0	10 6	11 0*	—	11 9*	12 0
Wit. Townships ...	31 0†	31 0†	31 0†	31 0†	—	—
Wolhuters	3 3	3 3*	3 4	—	3 3	3 4
West Springs	25 1*	25 3	25 4½	26 3	25 9	26 6
West Options	7 9*	7 9	7 9*	8 6*	8 4½	8 6
Zaaiplaats Tins	7 6	7 7*	7 6*	7 9	8 0	7 10*

*Buyers. †Sellers. AEx London. BOdd lots.

The Deepest Gold Mine.

St. John del Rey is the deepest gold mine, and also the deepest metal mine, in the world; therefore its annual report is of general interest. The latest report is the 88th, for the St. John del Rey Mining Company was organised in 1834. The enterprise is British, but the mine is in the State of Minas Geraes, in Brazil. Last year the output of gold was worth £423,029. The workings have reached a vertical depth of 6,326 feet. At the bottom the temperature is 116° F. when the ground is first penetrated, and even the mean temperature of the air underground during the summer is close to 100°, so that particular pains has to be taken to ventilate the mine with a view to rendering working conditions tolerable. The natural increase of temperature is one degree per 126 feet of descent. A large Sirocco fan is used and it is proposed to supplement this with an air-cooling plant. The deeper portion of the mine, below 1,940 feet, has been opened up in a most unusual way, by means of a steplike system of winzes and levels, each winze being 1,200 feet long and connected with four levels at intervals of 300 feet, so that, as a Cornishman would say, "the h'ore is pulled out by the 'air of the 'ead." The scheme of development depends upon the fact that the workings follow not the dip of the lode but the pitch of the orebody, which stands at an angle of 40°. The size of the orebody and the quality of the ore have shown improvement on the lowest "horizons," as they are called, although the showing is not so good as it was in the younger days of the mine, the dimensions of the orebody at 5,800 feet being about 15 feet by 1,000 feet, as against a width of 45 feet and a length of 600 feet in the upper workings. The reserve of ore amounts to 1,209,104 tons.

S.-W. TRANSVAAL DIAMOND RETURNS FOR JULY.

The particulars of the alluvial diamonds produced in the Klerksdorp mining district during the month of July show a record total output. The figures for the seven months of this year are:

	Carats.	Value.
January	3,385¼	£41,685 8 0
February	1,631½	41,968 8 6
March	5,431¾	51,166 0 0
April	5,530¼	59,261 7 6
May ...	5,964¼	68,473 10 9
June ...	5,116¼	63,863 10 0
July	6,384	86,922 0 0

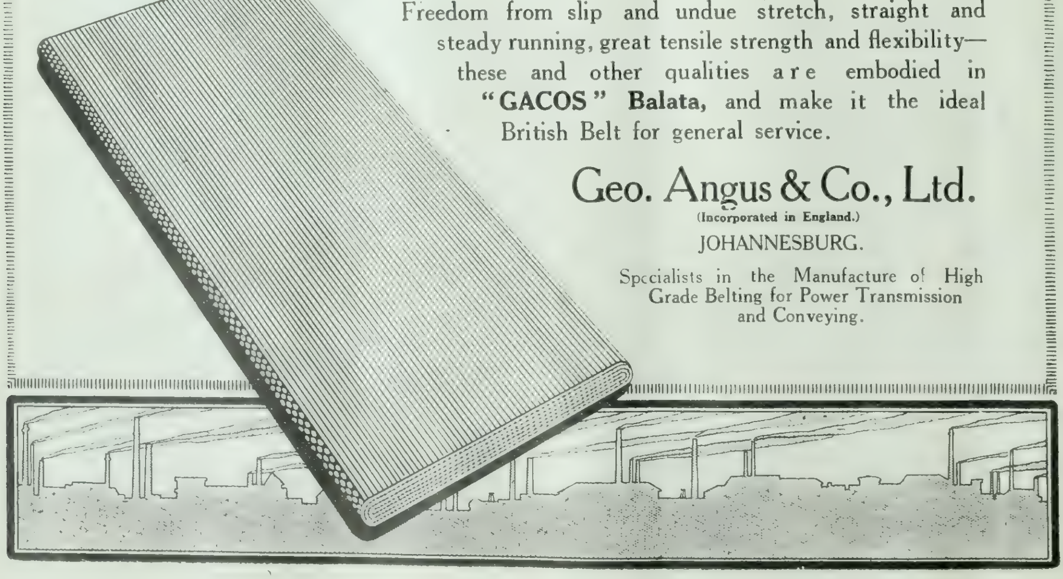
The Producing Areas

There were in all 39 different areas mentioned in the returns, and these were as follows, those in Bloemhof district being unmarked, * denoting Wolmaransstad district, † Potchefstroom district; Kareepan including Lavine's Prospect and Uitspan, and Klipkuil including Odendaal's Prospect and Uijs' Rush:—

	Carats.	Value.
Kameelkuil	1,780½	£23,954
Blesbokfontein ...	1,057½	13,970
Bloemhof ..	177	2,271
Bloemheuvel ..	76½	792
Besjieslaagte	12	157
Christiana	97¼	1,071
Dievedraai	53	799
*Doornbult	13½	861
Diamantdoorns ..	8¼	61
†Eastleigh	30¼	600
Goudplaats	55¼	967
Grootdoorns	10¼	159
*Holloway's Rust	11¼	994
Italie	110	1,671
Klein Italie	25	405
Klipkuil ...	1,223¼	15,957
*Kareepan ..	592½	8,254
Koppiesvlei	4	33
Katdoornkraal ..	21¼	481
Kafferspan	1	12
Kuilfontein ..	3¾	48
Leeuwfontein ..	140	1,608
London ..	255½	3,960
Mooifontein ...	70¾	923
Mimosa ..	12	181
Middelbosch	2½	42
Maroetjesfontein ...	5½	42
Naauwpoort ..	21	217
Plessisdam ...	92¼	1,618
Paufontein	9½	123
Rietput ...	3½	28
*Rietkuil	107	1,110
Sandringham	18¼	250
Syfergat	90¾	1,272
Schweizer-Reneke ...	89¼	1,621
Uitspanning ...	1¼	11
Vechtvallei	26	296
Van Zyl's Drift ...	0½	3
Zeventontein	13¼	91

Average price per carat: £13 12s. 3d.

The Employment Question. Notices or advertisements of appointments vacant on the mines or elsewhere, so long as the employment will be first offered to a returned soldier, will be published free of charge in the *S.A. Mining Journal*. In order to assist the mine secretaries to make known any vacancy for a returned soldier, a free copy will be sent weekly to every mine secretary who forwards his address to this office.



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TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

September Opens Quiet—August Output Decline—Miners' Phthisis Extraordinary Assessments—Iron and Steel—Timber and Building Materials—The Fat Stock and Maize Show—Oils, Colours and Turps—Electrical Goods.

A BROKING member of the Commercial Exchange remarked this week that he did not know when business had been so quiet as in the period from the 1st to the 10th inclusive. Another member agreed with this statement, as he only remembered anything like a decent order for shovels and drill steel. This was also borne out by a bar iron and steel merchant, as business was very slow indeed with the mines because they as a general statement were not doing any new construction work, as there was a shortage of natives and the question was always present as to what the Government would do for the poorer grade mines. During Wednesday it was rumoured that the mining people were having a meeting that afternoon in reference to the serious decline in the August output. The official statement says that losses occurred on 12 mines, chiefly because of the native labour decrease in August of 2,769. The Miners' Phthisis Act assessment of 16 producers under the control of the Central Mining Corporation showed an increase of £20,134. Also eight producers of the Barnato group had to provide £13,200 compared with £3,200 under the old Act. This caused an increase in working cost all round, and all the group profits have naturally been affected. It is further stated that the mining industry had come to the important decision that something had to be done, otherwise a few of the lower grade mines would have to be closed, and if that unfortunately happened the pumping of the various mines would be carried on. This information is of great importance, and it is desirable to mention it to explain the present deadly dulness in the mining material trade. It is also ascertained that the engineering shops in town are certainly not overburdened with work, and some anxiety prevails as to the future, and all this because of the smallness of the work from the mines in consequence, as our informant stated, of no new construction work being undertaken but kept back for future eventualities.

IRON AND STEEL.

The imported bar iron market is slightly better, as the overplus recently mentioned has been partly absorbed and cannot now be replaced at similar values on account of the enhanced prices from oversea. These remarks also apply to galvanised and other piping. There has been a drop of about 1d. a lb. all round in drill steel, but the worst feature is that prices are erratic, as a customer might come in and ask the price of drill steel, and on being told 1s. 6d. he might say that he could get it at 1s. 4d. or even less. The merchant giving this information further stated that these varied quotations might well be possible, as holders without backing would be compelled to sell owing to financial exigencies.

TIMBER AND BUILDING MATERIALS.

Deals are still scarce at 1s. 7d. to 1s. 8½d.; flooring, 8¼d. to 9d.; ceiling, 6d. to 6½d. Fancy woods have advanced in America, as they are costing more to handle; pine shelving, 1s. 2d.; poplar, 1s. 6d.; American oak, 1s. 4d. to 1s. 6d.; Japanese oak, 1s. 6d. to 1s. 9d.; Burmah teak, 22s. 6d. a cube; three-ply, 8d. Business is quite good from the building trade; there is very little demand from the furniture people on account of the strike. The Baltic news is that deals have been delayed, and there is an all-round tendency for prices to advance on account of the timber workers' strikes there. A very poor demand exists from the mines, not only for the Baltic timber, but mining poles and logs. The second-hand timber trade is exceptionally quiet, as no stocks have come in since our last report, and some articles, such as second-hand doors, windows and basement, are absolutely unobtainable. The dealers are pushing around for stocks, but most of the old houses have been cleared away, that is those required to make room for immediate erections, and any not required are naturally allowed to stay and earn rentals, now there is such a pressure for house accommodation. New galvanised roofing iron is still exceptionally scarce and the price is from 1s. 4½d. to 1s. 6d. per foot. It is said there are fair quantities on the water, but none near at hand; however ,there are small consignments now and again arriving from the coast to cope with urgent requirements. If this were not the case, then the price would be even higher, as many roofs urgently require covering before the heavy rains come.

THE FAT STOCK AND MAIZE SHOW.

"A wonderful show" was the remark heard again and again from the expert agriculturists attending the show on Wednesday and Thursday. The details are well served up by the daily newspapers, to be followed up by the weeklies. However, it is just as well to give a word of advice to our oversea readers on the subject of South African farming. Undoubtedly there is an excellent present but a greater future for the agriculturists in this country, as a great deal of the necessary spade-work has been done to illustrate our capabilities for growing maize, sugar, fruits, ostrich feathers, wool, cotton, tobacco and such like. At the show under review the maize exhibit is marvellous as regards quantity and quality; also as regards ranching there are no less than 200 pedigree bulls to choose from, as well as Berkshire

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boars for the bacon trade. Already much money has been sunk and lost in this bacon-curing trade, as the early curers thought more of the process in curing rather than the breed of the pig. These past efforts, however, are beginning to bear good fruit to-day, as our exports of bacon to the London market were fairly well received, although there is much bacon produced that will not stand such a test. The South African export meat trade also had its chance during the great war, and that also did better than most of us expected. Well to-day we are just ready for the new farmers with a certain amount of money, experience and grit. For example, along the coast we have the sugar plantations in Natal, supplying us now and throughout the war with the cheapest sugar in the world. Then at the Cape, in the Western Province, there are the grape growers at Wynberg (Constantia) to the Paarl and even to the Hex River Mountains. These grapes are of the best, producing raisins sufficient for our wants and allow a little for export, to say nothing of the great wine and brandy presses, which process of manufacture is already shown at our bioscopes. Then we have the wheat fields from Malmesbury to Wellington, to be picked up again in the Orange Free State. Throughout these various districts the cattle industry is always there with the farmers as apart from the big ranching in Rhodesia, a proof if needs be is our wool exports throughout the Union. Men may come and men may go, but this will become more and more an agriculturists country, with marvellous probabilities, as remember we have the coal, gold, diamonds, iron and base metal industries practically throughout the Union to supply markets.

Oils, Colours and Turps

Turps in New York, according to the latest cables, have reached the highest price ever known, as the quotation there is 93s. per case of two 4's. The Johannesburg price has been upset in consequence, and for the moment no sound quotation is available, it being somewyhere about 90s. Boiled linseed oil dropped 1s. per gallon in London on Thursday. (There has been no alteration here, as the English genuine raw is 70s. per four-gallon drum and 18s. 6d. per imperial gallon for the boiled. White lead, American, is 80s. per 100lb. keg.; English, 10½d. to 1s. per lb. Finest oxide in oil 70s per 100lb. keg. English putty 9d. per lb. in bladders and 7½d. in bulk. Ready-made paints, 1s. 6d. per lb. and 1s. 3d. for 70lb. drums. Business for paints, varnishes and all materials in this line is excellent, as everybody seems to be painting; however, there is plenty of labour of all kinds from the best to the ordinary painters of roofs, walls, etc.

Electrical Goods.

Inquiries in England by cable elicited the unwelcome fact that owing to labour troubles, etc., the steel strip, which is an important part of tubing, is not being manufactured in sufficient quantities to enable makers to cope with the demand, and that consequently tubing is practically unobtainable there. There are fair stocks of tubing here now, and further consignments are expected shortly, but the position in Britain in respect of this article gives cause for grave uneasiness. Nor is the uneasiness confined to tubing alone, but may be taken to extend to all electrical goods. Lamps can now be bought locally very much cheaper than they can be got in England (leaving freight and other expenses quite out of the question). One of our foremost dealers said that before the war we were practically dependent upon Germany for things electrical, as South Africa did much more with that country than with England and America combined. Now owing to labour troubles in both the latter countries dealers have not the stocks to draw upon. Of course, every effort is being made to obtain stocks from England, but the prices quoted there are, he says, simply ridiculous compared with those of America and Japan, and represent roughly about 50 per cent. increase on the German prices. Now that all restrictions have been removed as regards dealing with the Central Powers, dealers have not hesitated to open negotiations with them for electrical goods, of which there appear to be large stocks on hand, and human nature being what it is, both distributors and the public will not be slow in taking advantage of prices so much below those of either Britain, America or other countries. It only emphasises what we stated a week or so ago, that unless the British workman faces the position and has less to do with strikes and more with production the Old Country will—for a time at any rate—find itself seriously crippled in the renewed and feverish German competition. Town and country business continues very good indeed, one dealer being so busy that he has had to work on Saturday afternoon and Sunday to deal with increased orders. Lamps are still 21s. a dozen wholesale, or 2s. retail.

PERSONAL.

Mr. Percy P. Woodhams, A.M.I.Mech.E., of the Climax Rock Drill and Engineering Works, Ltd., is on a visit to the Rand.

* * * *

The postponed special general meeting of members of the Geological Society of South Africa will be held in the Council Chamber, Chamber of Mines, Johannesburg, on Monday evening, 15th September, 1919, at 8.15 p.m., at which the following recommendation of the Council will be submitted for consideration and adoption if thought fit:—"That certain MSS. and various maps and sketches accompanying same, dealing with the geology of Griqualand West, by the late Mr. G. W. Stow, and now in the possession of the Society, be presented by the Society to the Public Library, Capetown. That library already has in its possession various documents by the same author, and seeing that the MSS., maps and sketches above referred to deal with the geology of a portion of Cape Colony they are therefore of more interest to that Colony than to the Transvaal." Immediately following the special meeting the ordinary monthly meeting of members of the Society will be held.

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A REVIEW OF THE MINING INDUSTRY.—III.

Points from the Report of the Secretary for Mines and Industries for 1918.

In the course of his annual report for 1918 the Secretary for Mines writes:—

III.—Industrial Development.

The report of the Board of Industry and Science for the year under review is now in the press and contains a record of the questions which have been dealt with by the Board. In touching on the position of general industrial development in the Union, it may be observed that the last completed figures on the subject are those of the 1918 census for the year 1916-17, and any comparisons of figures that may be made refer therefore to that and the preceding year, except in the case of imports and exports, in which case the figures for the calendar years 1917 and 1918 are available. Before touching on actual figures of production a few remarks may be made regarding industries in which expansion has taken place during the year 1918, or which have been newly established. As to those in the first category it can be stated that there as been expansion in practically every direction. In the cultivation of cotton, for instance, much more interest is now being shown in the Union. Even sugar planters are going in for its cultivation to some extent, and some of these planters assert that, as a crop, it is more attractive than sugar. With a greater area under cotton, there will be larger supplies of cotton seed available for oil extraction and undoubtedly these supplies of cotton seed will be treated within the Union. Another oil seed bearing crop is flax, about which, and the linseed obtained therefrom, numerous inquiries have been received. Mention should also be made of sisal, the cultivation of which has greatly increased, and at no far distant date the Union should be supplying its own requirements of sisal hemp for the manufacture of rope, twine, sacking, etc., an industry which has made great progress during the year. The past year has seen the erection of additional cold storage works and depots, while the production of cheese, bacon, butter, condensed milk, food stuffs from cereals, and cereal by-products, such as starch, glucose, dextrine, malt, and malt extracts, shows highly satisfactory increases. Very gratifying progress has been made in the production of drugs and chemicals, paints, soaps, and candles, sugar by-products, cement and cement manufacture, furniture, glassmaking, boots and shoes, pickles and condiments, glue, fertilizers, basketware, rubber goods, sheep and cattle dips, and iron smelting. A tin smelting works has been started, while in the production of coke a commencement has been made with by-product plants. Having regard to the economic position of the world to-day, the present is undoubtedly a favourable opportunity for the investor to put capital into the development of Union resources. Great possibilities lie in the direction of steel production, of coal by-product and maize by-product industries, of woollen manufacture, fibre and cotton production, shipbuilding, and repairing, and the development of our deep-sea fisheries, to mention only a few of the most important which require large capital to be put into them.

Comparative Figures of Industrial Expansion.—The following figures denote the progress of industry in the Union between the years 1915-16 and 1916-17, and when the census figures for the year 1917-18 become available, it is anticipated that these later figures will show that progress has been well maintained.

	1917. Census for Year 1915-16.	1918. Census for Year 1916-17.
(1) Number of factories in Union	3,998	5,305
(2) Capital invested	£46,532,750	£51,106,967
(3) Value of South African materials used	£10,024,773	£13,731,251
(4) Value of materials used from outside South Africa	£12,290,814	£14,292,697
(5) Value of manufactured articles	£32,921,575	£39,178,182
(6) Number of labourers employed:		
(a) Europeans	39,524	46,100
(b) Coloured	26,589	30,929
(c) Natives	35,065	46,813
(7) Amount of wages paid:		
(a) Salaried staff	£1,395,194	£1,741,485
(b) All other employees ...	£7,517,663	£8,695,209

Regarding item (5) "Value of manufactured articles," the figures do not include the value of work done, such as engineering repair work of the value of over £6,000,000, house-building of nearly £3,000,000, repairs to vehicles £598,000, etc., the total value of such work in 1916-17 being £10,279,000. Otherwise the figures in the foregoing schedule speak for themselves, and it is very gratifying to note that such substantial progress has been made. In the Union's trade overseas and with other South African countries, considerable expansion is also recorded. The figures of imports and exports for the calendar years 1917 and 1918 are given below:

	1917.	1918.
Exports of South African produce and manufacture (excluding gold)	£25,791,923	£28,912,736
Imports	£38,365,580	£49,487,168

Reference may be made here to the unsatisfactory condition in which certain commodities have been exported recently from the Union, and it cannot be too strongly urged that exporters should take every care to ensure that no trash is sent overseas. One or two consignments of bad quality can only tend to give the Union as a whole a bad name in respect of a particular commodity and the default of one exporter may react disastrously on other producers of the same article. At present Government graders exercise control where such commodities as maize and wool are exported, and it may become necessary to consider seriously whether some form of control should not be exercised in respect of certain other commodities intended for export.

(To be continued.)

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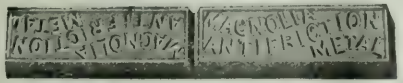

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Company Meetings.

GENERAL MINING.

ANNUAL MEETING.

The annual meeting of the General Mining and Finance Corporation was held on Sept. 4, and the report of the directors and statement of accounts were unanimously adopted, after an exhaustive review of the operations of last year by the chairman, Sir George Albu. He said:—

The summarised references in the report to the operations of their subsidiary companies for the period brought out only too clearly the struggle for existence which had continued, in the instance of most of them, during the year, owing to the extraordinary difficulties with which they had had to contend. When they considered that these unfavourable conditions had had to be faced, in an increasing degree, for the best part of five years, it was not difficult to conceive their almost overwhelming cumulative effect, and the grave position in which, as a consequence, several of their mines were placed at the present time. Their investments at December 31 last showed a further depreciation of approximately £12,000, as compared with the position at the close of the previous year, and the profit earned by the Corporation for 1918 at £25,434 reflected a decrease of £18,700 as compared with the figure for 1917. Having regard to all the circumstances, these results were not surprising. It must be remembered that in 1917 they were already feeling the serious effects of war conditions, and that the total working profit of the six producing mines for that year, of £655,198, was a considerable reduction on pre-war earnings (the corresponding figure for 1914 being £779,654). The results for 1918, however, were far below those for the previous year, and served to illustrate the cumulative effect of struggling for a period of years against abnormal conditions; the total working profits of the six mines in question (after deducting working losses) amounted only to £357,209, of which £288,436 was earned by the Meyer and Charlton, leaving only £68,773 for the whole of the remaining five mines. In considering these figures it must be remembered that they do not represent net profits, but only working profits; in other words, they do not allow for such charges as interest on loans or debentures, Government taxes, and assessments for miners' phthisis compensation.

Net Profits.

If they took net profits for their basis then the figures for 1918 were much worse. The Charlton earned a net profit of £205,723, the Van Ryn Estate approximately £63,000, and the Aurora West a merely nominal net profit of £1,932; whereas, per contra, the three remaining mines made an aggregate net loss of £69,278 (Roodepoort United £53,129, New Goch £2,259, and West Rand Consolidated £13,890), as compared with an aggregate net profit for the same three mines of £109,774 for the year 1914. In addition, one must bear in mind the reduced ore reserves of the mines concerned, by reason of their having been obliged, owing to the much higher scale of working costs brought about by the war, to eliminate from the reserves large quantities of ore which under pre-war conditions would have been payable, and also, in the endeavour to make revenue balance expenditure, to take, in the instance of some of the mines, a larger percentage of higher grade ore than the position of the ore reserves would have strictly justified in normal times. He did not mean to suggest that the mines had been systematically gutted; the process of mining a larger percentage of the better grade rock was a very gradual one—so gradual as to be almost unnoticeable for some time; but here again the cumulative effect became apparent. What would have represented an insignificant decrease if only carried out for one year became a serious depletion when practised during the five years of the war period. So the effects of the war on the operations of several of their subsidiary companies were not to be measured only by the decreased profits—although, as he had shown, that is a sufficiently serious aspect—but also by the considerably reduced payable ore reserves of these particular companies at the present time, when compared with the position at the end of 1914. The disastrous influence of the war on the gold mining industry as a whole had been to some extent masked by the successful operations of the mines of the Far East Rand, but the long list of mines on the Central, East, and West Rand which were to-day working either at a loss or with a merely nominal margin of profit, bore ample and practical testimony to the culminating result of the abnormal and difficult conditions with which they had had to contend for the past five years.

The Balance Sheet.

In reviewing the accounts of the Corporation for the past year he said they showed few changes of importance as compared with the accounts for the previous year. Taking first the debit side of the balance sheet: Deposits had increased by £2,500, but as that liability was to a company in which they hold the whole of the share capital it really constituted a debt to themselves. Creditors for stock bought showed a decrease of £1,300, and sundry creditors a small reduction of £200. The credit balance on appropriation account was increased by the net profit for the year of £25,400 to a total of £74,671. On the credit side of the balance sheet their investments in stocks and shares of companies under their own management showed a net decrease of £26,000, representing the proceeds of small parcels of certain shares sold, less the cost of shares purchased in other of their companies. On the other hand, they had added to their holdings in outside companies by purchases to the value of £8,000. Debentures of public companies, etc., reflect a decrease of £1,100 in respect of realisations. Mining properties and claim holdings showed an increase of £1,800, and advances against security were also higher by £11,500, chiefly in respect of money lent out in London on approved security. The largest increase, however, was on sundry debtors (including advances to mining companies), in respect of further loans to the Roodepoort United Company, in addition to a portion of the old debt of that company, which was taken over by the bank a few years ago, under the guarantee of their corporation, and which they were now gradually taking back. These two outgoings together amounted to £109,800, but as against that repayments were made to them by other companies to the extent of £49,300, so that on balance the sub-heading of sundry debtors was only increased by £60,500. Cash at bankers, £162,861, showed a decrease of £28,200, representing the loans to the Roodepoort United, after taking into account the net amount realised by sales of shares, etc., and allowing for the increase of other forms of assets as already described.

Dealing next with the profit and loss account, he said:—Administration expenses showed an apparent increase of £2,300. That does not, however, represent actual additional expenditure, but was really due to a decrease in the "amounts received from other companies"—in that case a reduction in the scale of fees previously received by them for management, owing to the fall in profits of the companies concerned. The debit for interest reflected an increase of £4,100. That charge to the profit and loss account was the balance of interest paid over that received. They took no credit in their accounts, however, for any interest due to them, but not actually paid in respect of loans to certain of their subsidiary companies, and for that reason the interest received by them last year showed a reduction. Loss on mining ventures, etc., for the past year, at £380, showed a diminution of £7,800. On the credit side of the account, the profit of £1,322 on stocks and shares realised was less by £5,100 than for the previous year. Sundry revenue also showed a decrease of £15,000, which was wholly due to the reduction in the previous rate, or the suspension altogether of dividends from their holdings in their subsidiary companies. That decrease in itself almost entirely accounted for the drop of £18,700 in the profit of the Corporation as compared with 1917.

Subsidiary Companies.

With regard to the mining operations of their subsidiary companies for the current year, the results, for the most part, were even worse than those for 1918. The Meyer and Charlton and the West Rand Consolidated had maintained their respective working profits. The Van Ryn showed a slight decrease in the average monthly profit earned, and the Roodepoort United, Aurora West, and New Goch had operated at a loss for the period. As both the Roodepoort United and Aurora West were heavily in debt to their Corporation, and the surplus funds of the New Goch were approaching exhaustion, it was unnecessary for him to emphasise the critical position of these companies at the present time. There was necessarily a limit to their capacity, and also to the justification for continuing to finance companies already deeply involved in liabilities, and which, in addition, were unable to earn sufficient revenue to cover actual expenditure, and they would fully appreciate his statement that they could not maintain that course much longer. As they were aware, it had been their practice, rightly or wrongly, to foster and assist the companies under their control to an extent which in recent years had drained their resources, and had seriously handicapped their efforts towards undertaking new business He must frankly say, at that late stage, that he was at times doubtful whether their actions in that connection had not been unduly quixotic; the fact remained that they adopted that policy, but it was patent that their present financial position precluded them from continuing it much longer.

Referring to the Low Grade Mines Commission, Sir George said he took the opportunity, at the annual meetings of some of their subsidiary companies a few weeks ago, to refer to the hopelessly illogical attitude of the Government in occupying the last week or so of the session in rushing through Bills placing still further and heavier burdens on the mining industry, which could only have the effect of hastening the closing down of the lower grade mines, and at the same time appointing a Commission to enquire into the steps which could be taken by the same Government to keep them alive. The terms of reference to the Commission, which was at present sitting, were sufficiently comprehensive to keep it hard at work for the next twelve months, in which period several of the mines, subjects of the enquiry, might have already suspended operations. It seemed likely, therefore, that unless in the meanwhile Parliament decided to take some immediate step towards practical relief, the future sittings of the Commission would take the form of a post-mortem examination. In view of the large proportion of lower grade propositions in the mines under their control, they were asked to give evidence, and a very comprehensive and detailed statement was presented on behalf of their group a few weeks ago. In regard to the most vital term of reference, i.e., "What steps can be taken by the Government to obviate the closing down of any or all of these (low grade) mines," they advanced, amongst others, the following main suggestions:—(1) Reopening of recruiting north of latitude 22 deg. south; (2) removal of colour bar; (3) grants of subsidies.

Dealing first with the reopening of recruiting in tropical areas, he need hardly remind them that one of their principal troubles for very many years had been the inadequate supply of native labour from existing sources. That had seriously affected their efforts by restricting the scale of their mining operations and retarding shaft sinking and development work. It was now recognised by most people that, outside of a sentimental opposition amongst certain politicians to the introduction of any coloured labour from outside the Union, there was no practical objection to the proposal, which was supported by medical opinion that, providing these natives be inoculated with Dr. Listers vaccine, their mortality whilst on the Rand would be no greater than that of the British South African or East Coast native. In fact, judging by such information as was available regarding the mortality in their own country, it was highly probable that the 'tropical' natives would, owing to the excellent feeding, housing, and medical attention given on the Rand, enjoy better health here than in their own homes.

The Colour Bar.

The next point, the removal of the existing colour bar, was naturally of a more controversial character, as the white employe regards any suggestion for improving the status of the native as prejudicing, or even endangering, his own position. On the other hand, the more educated and intelligent native was desirous of bettering his status. At present he was restricted to unskilled work on the mines, and could not hope to rise to a higher plane so long as the existing mining regulations were in force. That class of native probably represented a small proportion of the great mass employed, but he formed the dissatisfied element which had the effect eventually of infecting large numbers of his fellows with unrest and discontent. They had had practical evidence here, especially in the last two years, of the growth of that discontent, and it was because they felt that only the relaxation of the present restrictions would remove that feeling that they advocated the removal of the colour bar. He did not for a moment believe such removal would have any appreciable effect on the employment of the white miner or other skilled workman. He thought the result would be that a certain amount of the semi-skilled work on the mines at present performed by white men would, in time, fall within the scope of the experienced or intelligent native, and that new opportunity for the latter would go a very long way to allay the restlessness of the natives as a whole.

Subsidies to Poorer Mines.

As regarded the granting of subsidies to the poorer mines, their suggestion was a clear-cut one. They did not propose any involved scheme of an allowance of so much per ton —which might or might not, enable the mines to work at a profit. They simply asked for a subsidy sufficient to cover the monthly working losses and, in addition, the current development and shaft sinking work to a sufficient extent to keep the mine going, by replacing the ore taken out in the course of ordinary milling operations. He admitted that at first sight that would appear to be a most unusual request, but it was nevertheless a perfectly sound proposition for the Government to entertain. It was an admitted fact that a vast proportion of the revenue of the State was derived, directly or indirectly, from the gold mines, including, of course, the low grade mines. On the basis of the reports of several Commissions and Government officials published during the past 10 or 12 years, they had worked out the revenue accruing to the State from the four low grade mines of their group which were in need of immediate assistance if they were to continue operations and, taking a conservative view of the question, they arrived at an aggregate figure of £400,000 per annum, which would be lost to the State in the event of these mines closing down. Assuming that the present scale of working losses continued without any sort of relief in the direction of decreased working costs or increased price of their gold, the total sum required to cover these losses and a moderate amount of shaft sinking and development work would be £143,000 per annum. In other words, by granting a total subsidy of £143,000 for the four mines in question, the State would save £400,000 of its present revenue. Surely this was a business proposition so far as the Government was concerned? And the Government should have the less hesitation in agreeing to the proposal for the obvious reason that any material reduction in working expenditure, accompanied by increased revenue from a premium on gold, would have the effect of considerably decreasing, if not eliminating altogether, the necessity for such subsidy. To sum up, it would pay the Government to come to their assistance even if the full amount of the subsidy were required: still more so in the possible event of the subsidy actually needed being a comparatively small matter.

Worked-Out Claims.

They also suggested, as one of the farms of relief that might be given, the remission of the Government share of claim licences, which at present constituted a heavy burden in the instance of low grade mines holding an extensive area of ground. The taxation in that respect automatically became heavier each year, as additional prospecting claims were brought under attack and had therefore to be converted into digger's claims subject to four times the tax applying to the former. The absurd anomaly, however, was that, once having been converted, these digger's claims remain as such for all time, so long as they were held by the same owner: they had to bear the same taxation even after the whole of the payable ore had been extracted. The only alternative was to abandon them, but that was generally impracticable as they had to be held in order to protect their rights over ore passes, shafts, water mains, etc., underground. Surely one of two courses should be adopted —either that the licence payment ceases altogether on certification from a Government inspector that the claim had been exhausted of its ore contents, or, at all events, that in such an event they should be able to reconvert it into a prospecting claim. To-day, in the case of some of their mines, they were paying the heavy digger's licence money in respect of the whole of the original mining area, although with the exception of a few claims, that area had been absolutely worked out. He wished to record emphatically his firm conviction that neither the Government nor the freeholder was morally entitled to that licence money in the case of worked-out claims. The licence was given to work the claims, and during the whole of the period that the claims had been worked the Government and the freeholder had had their tax — whether the ore taken out had been treated at a profit or not—consequently it was both inequitable and illogical that they should have to continue the payment of licences in respect of claims which they could no longer work because they had been exhausted.

Lower Efficiency.

There was just one other point to which he would like to refer. In their statement to the Commission they mentioned the lower efficiency which they were now getting on the mines as compared with pre-war standards, and especially since they reduced the working hours of their employes. Their technical adviser was closely examined on that point by several members of the Commission, and there was a tendency to question the correctness of his statement. It was interesting to note that his views were confirmed by figures which had since been compiled on behalf of the industry as a whole, and which showed conclusively that since the inauguration of the shorter working week, at the commencement of 1918, there had been a reduction of 15 per cent. in the output per native employed on tramming and shovelling —apart from losses of efficiency in other directions. Never in his previous experience had his works and duties in connection with the corporation and their subsidiary companies been accompanied with so much anxiety and worry as he had had to contend with during the last three or four years. Always, when they seemed to have overcome their immediate troubles and to be getting into smoother water, some new difficulty or disappointment arose, until one's powers of endurance were stretched almost to a breaking point. However, they must persevere, in the hope which was ever before them in gold mining that their efforts would eventually be rewarded by a return to more prosperous conditions. There was one direction in which he thought they could and should be assisted. As he had already mentioned, during the war they kept all their mines going at full pressure, in spite of the fact that their profits were either considerably reduced or con-

[illegible] [illegible] working losses; they strained their properties to the utmost, and they were now feeling the disastrous consequences. That was not only justified, but it was their duty to do so under the special circumstances then prevailing. Nevertheless, in view of the heavy cost, he felt that they should now receive some recompense from the Imperial Government in the shape of the rebate of a portion, at all events, of the benefits which must have been derived during the war by the Bank of England and the Home Government out of their gold. Their product was second in importance only to munitions, and yet the gold producers were the only large contributors to the stability of the cause of the Allies, who had been unable to pass on a single shilling of the crippling burdens caused by the war. So far from their getting an extra consideration for the gold, they received a lower price than before the war. Now that, happily, the world calamity was past, he felt it his duty to put forward a plea for assistance which might go a long way towards helping them to tide over the existing crisis, and enable them to keep going until better times arrived.

TRANSVAAL GOLD MINING ESTATES.

A special general meeting of members whose address is elsewhere than in South Africa, of the Transvaal Gold Mining Estates, Ltd., was held at Salisbury House, E.C., on August 7, Mr. Mathew Taylor Brown presiding.

The Chairman, in the course of his remarks, said the improvement in the unwatering of the mines continued steadily until October, when a fresh disaster overtook them in the outbreak of the influenza scourge, the Pilgrim's Rest district suffering particularly. The natives took fright and fled, bringing the work practically to a standstill, with the result that in November, December, and January there were losses amounting to £18,266. In February they almost made ends meet, and in March they attained a profit of £3,198. The tonnage treated during the year was £144,245 tons, a decrease of 38,440 tons, 30,000 tons of this decrease being accounted for by the influenza stoppage. The revenue from gold produced was £231,358, equal to 32s. 1d. per ton, as against 36s. 10d. in the previous year, the costs being 30s. 9½d. per ton, an increase of 3s. 8d. The net working results showed a profit of 1s. 3.3d. per ton milled, which was a very narrow margin. To this profit, however, there had to be added a net amount of £6,322, coming under the head of general revenue, which brought the profit per ton up to nearly 2s. 2d. The actual net profit for the year, amounting to £15,551 18s. 5d., was just about the sum paid away in the one dividend of the year. This meant that, as they had to redeem debentures and incur some capital expenditure, their cash resources had to be encroached upon, which showed the wisdom of the policy that in the past built up a good reserve. The rise in costs was a serious matter, the working expenditure showing an increase of 3s. 7½d. per ton on the year. This was largely due to the diminished output, the expenses of unwatering the mines, and repairing the damage done by the floods, and partly to the continued effect of the war conditions and to the standing charges while the mills were shut down.

Referring to the balance-sheet, the Chairman said the outstanding debentures had now been reduced to £19,000. Mine development suspense had increased from £25,478 to £30,020, consequent on the necessity of putting all available labour on to the work of repairing flood damage. On the credit side, the mine development stood at £131,140, or £345 less than before, although the tonnage of ore developed showed an increase of 13,000 tons. The rate per ton now worked out at about 4s. 11d., as against 5s. 1d. per ton in the previous year. Buildings, machinery, and plant showed a net increase of £10,780, chiefly due to cost of the Ponieskrantz tram-line, tree planting had been written down by £1,429, and the Wattle Plantation account by nearly £300. Shares in other companies was reduced by £5,500, and stores and material showed an advance of over £6,000. Deposits, cash, and gold consignment account showed a decrease of £40,000, accounted for principally by the purchase of debentures, capital expenditure, and increased stocks of stores.

The Chairman, dealing with the prospecting and development operations, said only 15,894 feet of prospecting work had been done, as compared with 24,502 the previous year, due to the causes he had mentioned. The development footage also showed a big drop of 11,400 feet. But, he pointed out, the ore reserves were actually higher than in the previous year and established a record for the company, and this was ore which had so far been developed and was ready for mining. On the basis of milling 180,000 tons per annum the reserves equalled three years' supply of ore, which was a satisfactory position. The result of the agreement now signed with the Bank of England as to the price of gold, by which the mines would be able to get the benefit arising from the rates of exchange, would be, if their company could take advantage of it, on last year's grade of ore an additional annual revenue of £22,000. The results for April, May and June of the current year showed a slight progressive improvement, which he hoped would continue.

A vote of thanks to the chairman concluded the proceedings.

Engineering Progress: Sir Charles Parsons's Address.

The Hon. Sir Charles Parsons, the well-known engineer, delivered an interesting inaugural address when presiding over the meeting of the British Association at Bournemouth. He dwelt at length on the developments during the war, dealing, *inter alia*, with turbines, sound ranging and listening devices on land and sea, and also with engineering, electricity, etc. He remarked that there was no golden rule to secure cheaper electricity, but, generally speaking, the best way was by a widespread network of mains. The electrification of tramways and suburban railways in Britain had been an undoubted success. Where the volume of traffic justified a frequent service, the electrification of the main lines would save consumption of coal, but the economical success of such enterprise would depend upon whether the volume of traffic would suffice to pay working expenses and provide a satisfactory return on capital. England was using up her resources of coal more rapidly than most countries, and long before any near approach to exhaustion was reached the seams would have become impoverished and the cost of mining would be so much increased that, given cheap transport, it might pay her better to import coal. As regards water power, the amount available in Britain was under 1½ million horse power, compared with 20 millions in Canada, 30 millions in the rest of the Empire, and 150 millions for the remainder of the world. He was of opinion that the average capital required to produce electrical power from coal was less than half the amount required in the case of water power. The running costs in connection with water power were, however, less. The cost of harnessing all the water power in the world would be £8,000,000,000. Referring to possible new sources of power apart from molecular energy, Sir Charles Parsons mentioned a suggestion he made in 1904 to sink a shaft 12 miles into the earth, the estimated cost to be five millions sterling and the time required to be 85 years. Since he made this suggestion experiments had been conducted by Professor Adams, of McGill University, Montreal, showing that the scheme was practicable in limestone to a depth of 30 miles. The speaker remarked that little was known at present of the earth's interior except by inference. He believed his suggestion, if carried out, would prove of inestimable value to science. He pointed out that boreholes had been sunk at Lardarello in Italy, which discharged large volumes of high pressure steam, which was being utilised to generate ten thousand horse power by turbine, while near Naples a similar project was on foot to supply power to great works in the district. It seemed probable that in the volcanic regions a very large amount of power might be obtained directly by boring.

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Notes and News.

Interim Report on Low-Grade Mines and the Native Labour Supply.

An interim report by the Low-Grade Mines Commission was laid before Parliament during the week, but no discussion took place upon it. The Government will doubtless act upon it, however, without delay, as the matter is one of urgency. The first and most important result is expected to be the granting of permission for the importation of tropical natives to supplement the labour supply. In this way, it is hoped to obviate the closing down of any more mines in the immediate future.

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S.-W. Diamond Output.

The tax on diamonds in the South-West Protectorate for 1918 was £210,643. During the year 372,139 carats were produced, of an estimated value of £749,000.

* * * *

Deep Water Diamonds.

The Deep Water Diamonds Company's engineer wires that the pontoons have been successfully launched and are floating on the river. The balance of the plant, the construction of which has been delayed, is now being railed. It is anticipated that the plant will be working and results known early next month.

* * * *

The Diamond Conference.

The President of the Transvaal Alluvial Diamond Diggers' Union (Mr. A. van der Merwe), the Vice-President (Mr. van der Poel Exton), and Mr. George Whitehead have returned to the Transvaal, after a visit to Capetown, during which the Minister of Mines verified the statement made at the conference of diamond producers there that the alluvial output and the present marketing conditions would in no way be interefered with.

* * * *

Custodian's Report on Enemy Holdings.

The report of the Custodian of Enemy Property, covering the period from the inception of Act 39 of 1916 to June 30, shows that assets vested in the Custodian amount approximately to £12,603,463, including gold mining and other shares and debentures to the nominal value of 5½ millions, while dividends received on mining shares total £1,733,473. The number of individual persons whose assets in the Union are controlled by the Custodian exceeds a total of 10,000. Twenty businesses the property of enemies have been wound up. Thirty-six businesses are controlled (not including the German missions, which are also controlled). The vested value of trading rights and other property of German missions in the Union is approximately £875,000.

* * * *

Chamber of Mines' Quarterly Meeting.

The next quarterly meeting of the Chamber of Mines will be held next Monday. Many important matters are dealt with in the report of the Executive for the quarter. *Inter alia*, it is stated that the arrangement by which the Bank of England purchased the Transvaal gold output, taking delivery in South Africa, has by agreement terminated, and a new arrangement been entered into. Under the new arrangement all gold, with the exception of such small quantity as may be required for local currency requirements, will be consigned to the Bank of England, but will be sold by the gold producers' agents, on their behalf, in the best available market. Messrs. Rothschild have been appointed agents for this purpose. The Executive Committee has engaged the services of Mr. Kahan, of the Royal Mint, Perth, Western Australia, for a period of one year, to advise the Chamber in connection with the establishment of the proposed Refinery. The Provincial Council has refused to authorise the usual vote of £5,000 per annum, the Government's contribution towards the upkeep of the Springkell Sanatorium, provided for under the agreement with the Government of the Transvaal, dated May 11th, 1910. Application has therefore been made to the Union Government for this amount.

The Engineers' Directory.

Excellent progress is being made with the preparation of the S.A. Engineer's, Electrical and Allied Trades' Directory, which is now in the press. To ensure the utmost accuracy and completeness a vast amount of work has been entailed, and the book in its final form will be a complete directory of the firms engaged in the engineering, electrical and allied trades, *plus* a list of the personnel of the mines, railways and municipalities throughout the Union and Rhodesia. Firms who have not yet returned the forms sent to them are earnestly requested to do so without delay. In some cases firms have sent in the lists of their specialities for the Buyer's Guide Section without signing them, and it would much simplify the work of compilation if firms conscious of having made this omission will communicate the fact to the Publishers, care of this journal.

* * * *

The Economic Outlook in the S.-W. Protectorate.

"Provided the demand for diamonds continues, and prices remain at the present satisfactory level, the finances of the country should cause no anxiety, as the tax on diamonds will provide the greater portion of the revenue required annually for administrative purposes; but this will be conditional on this country being dealt with lightly in the matter of public debt charges. If any arrangement were adopted whereby South-West Africa had to bear the interest and sinking fund charges on the loan (or even a portion of it) from which the expenses of the 1914-15 campaign and of administration have since been met, it might seriously handicap, if not altogether destroy, development; but until the precise terms under which the Union will exercise its mandatory powers are known, it is not possible to express any decided views on this question." These sentences sum up the concluding portion, dealing with the financial and general outlook, of the Administrator of the South-West Protectorate, Col. Gorges, for the year 1918.

* * * *

Electrification of Railways.

Elsewhere in this issue will be found a *précis* of the important report by Messrs. Merz and McLellan on "the possibilities and advantages of the electrification of certain sections of the South African Railways." From this it will be seen the fundamental question as between electricity and steam is one of balancing economies in working costs, *plus* profit on increased receipts due to the greater facilities offered for travel, *plus* economies effected in respect of new rolling-stock and replacements and repairs, against the additional capital outlay required for electrification. Some of these factors are difficult to estimate. For example, no one can gauge with any pretence to precision the increase in suburban traffic which would follow an acceleration in the train service and improvements in respect of frequency and comfort. Other factors, again, can only be appreciated in reference to details of organisation, of which the public is, generally speaking, completely ignorant. If the views of the authors of the report are correct, the extensive adoption of electric traction on the railways would contribute to meet a number of demands by providing increased speed and comfort in travelling, facilitating railway development on the most economical lines, relieving the shortage of rolling-stock, encouraging the workers in cities to live in garden suburbs, and, last but not least, diminishing the need for the more unpleasant forms of manual labour. Much of the report is naturally of a highly technical character, and we hope to quote from it more fully in future issues.

* * * *

The Diamond Conference and the S.-W. Output.

The taxation of diamonds produced in South-West Africa gave rise to an important debate in the House of Assembly this week. Most people are aware that during the past week important conferences have been in progress in Capetown regarding the sale of diamonds. Mr. Jagger, speaking in the House, said that the output of the South-West Africa mines could be largely increased and ought to be without further delay. He suggested that the quota from the new territory should be increased, and that it should be sold on the basis of the series. Further, he protested against the system under which diamonds are valued in London, and strongly recommended that under any new contract the commission for the sale of the diamonds should be reduced from 10 per cent. to at the utmost 2½ per cent. Mr. Malan, in reply, stated that a strong Commission is to be appointed to investigate all concessions in the new territory. All mineral rights are to be reserved to the Crown. On the diamond question the Government has decided not to reconstitute the old German Regie, but to act itself as the Regie and to compel the diamond producers to hand their diamonds over to the Government for disposal. An Advisory Board, with three Government representatives and five appointed by the producers, is to be established. As to the agreement with the Diamond Syndicate, there is a dispute on the point whether the contract ends with the declaration of peace with Germany or whether, as the contractors maintain, the war is not at an end until peace has been concluded with all the Central Powers. Negotiations on the point are proceeding.

* * * *

Mining Regulation Contraventions.

In the course of his annual report for last year, the Government Mining Engineer says: The constitution of the courts at present available for prosecution in the case of contraventions of the regulations has been adversely criticised on the Witwatersrand. The Mine Workers' Union, the Underground Officials' Union, and the Society of Certificated Mechanical Engineers, have all expressed their dissatisfaction, and the Inspectors of Mines and Machinery have, from their point of view, also on numerous occasions pointed out the disadvantages of bringing cases before the ordinary magisterial courts. As long ago as 1908 the Mining Regulations Commission of that year reported in favour of the establishment of a special court to hear cases arising out of breaches of the mining regulations. This has, however, not been effected, and the result has been universal and increasing dissatisfaction, the complaint being that the technical questions generally dealt with are as a rule not satisfactorily expounded to or grasped by the court, and that injustice results or that offenders escape without punishment. The most general solution of the difficulty suggested has been that there should be a special magistrate, assisted by technical assessors. It would appear that the assistance of assessors might be dispensed with, if the cases were tried before a magistrate who had had a legal training enabling him to deal with technicalities, if at the same time he specialised to some extent in mining and machinery. The fully trained lawyer should be capable of grasping the essentials in all technical cases, since otherwise our judges would be unable to dispense justice adequately in medical and other professional suits. The chief trouble on the Witwatersrand arises from the fact that there are frequent changes in the personnel of the various magisterial benches and in the ranks of the public prosecutors who take these cases, that sometimes the magistrate has not had the training or experience necessary to enable him to deal with intricate technical cases, and that the court work is so congested that adequate time and attention cannot be bestowed on the preparation of the case, and that long delays frequently ensue before cases come on for trial. There is also another singular feature about mining prosecutions on the Witwatersrand. When a case is brought before a judge and jury, it is only rarely that a jury will convict. The result is peculiar, for when the offence is particularly grave, as in the case of a contravention of the regulations whereby one or more persons have been killed, the charge is, as it ought to be, practically that of culpable homicide. The Attorney-General naturally decides that the offence is too serious to take before a magistrate, and therefore brings before the higher court. It is, however, a foregone conclusion that there will be no conviction, whereas if the case had been heard before a magistrate on the minor charge of contravening a regulation, there might have been some punishment. If, therefore, the miner can only manage to kill one or two natives when he breaks the regulation, he is pretty sure to get off scot-free.

TOPICS OF THE WEEK.

AMERICAN CAPITAL FOR THE RAND.

THERE are signs that the long-looked-for advent of American capital to the Rand is now at last likely to take place. For instance, one of the features of the London and Johannesburg share markets at the present moment is the strength of Consolidated Mines Selection stocks. Anglo-Americans, Rand Selections, Springs, West Springs, Brakpans and Daggafonteins have all been bid up very appreciably in price recently and further advances are predicted. In addition to the improvement in the gold market and the better developments now being secured at the "C.M.S." subsidiaries generally, it is understood that Anglo-Americans and kindred stocks are about to be introduced on Wall Street. This is regarded as a most decided bull point. America is to-day literally overflowing with wealth, and if American financiers take an interest in Main Reef stocks and shares we shall certainly see enhanced prices for stocks and also tap another source of capital supply for the development of new areas. Some weeks ago we alluded to the prospective provision of capital for the Western Rand Estates by American interests and the projected reopening of the Grootvlei property by Messrs. Lewis & Marks may also be connected with the same eventuality. Just two years ago we first pointed out in these columns that to America we might have to look for a portion of the fifty millions of capital, which Sir Robert Kotzé, in his now historic report, estimated as necessary to develop the Far East Rand. It may be remembered that in referring to the association of American financiers with the Rand, *The Times* some time ago described it as the inevitable outcome and natural result of the "impossibilty of raising money in Great Britain," and opined that South Africa would welcome American participation, "because it supplants the German financier." Another London paper said that while it was to be hoped that no spirit of jealousy or "dog in the manger" policy would be displayed by the other Kaffir houses in opposition to the scheme for bringing American capital to the Rand, some of the London papers had allowed their enthusiasm over the new departure to carry them rather too far. It recalled that to bring the Government Areas' big property to the producing stage no less than £1,900,000 of British capital had been spent since the company's flotation in 1910. Even during the war the Consolidated Mines Selection Company and its friends raised some £600,000 in connection with the Springs and Daggafontein deals, and obtained the guarantee for whatever more was wanted. The fact is that more capital is now required, and, whether the source be London or New York, the Rand will welcome the capital necessary to develop the Far Eastern basin. Mr. F. W. Hirsh, the editor of the *Economist*, in a recent lecture at the London School of Economics, declared that the Colonies would have in future to provide themselves with most of the capital required for their development. Though, as some figures recently compiled by the Chamber of Mines showed, South African investors are in an increasing degree acquiring the cream of Rand dividend-paying stocks, the day when this country can fully satisfy the demand for fresh capital for the extension of the gold mining industry seems still far distant. Outside capital must continue to be interested in the development of our industrial resources; and the only question is to what extent the United States will supply that capital and so fulfil the roseate expectations now aroused. Commenting on a statement issued by the National City Bank of New York, which, we understand, is now about to open branches in this country, the *Statist* remarked that foreign countries "in all quarters of the globe are sending money to the United States for safe custody and for business purposes. It is believed that Germany has sold a large quantity of American securities in the United States in the past three years, and it is known that Great Britain and France have also sold substantial amounts." Then we have the opinion of no less an authority than Mr. G. E. Roberts, formerly Director of the United States Mint, who, in a recent address, declared that "there can be no general revival of trade in the countries where we hope for it most; no large opportunities unless we take the place of Great Britain and Germany in providing capital for development purposes." America, we have abundant evidence to show, has its eye on the trade of South Africa. Trade, we know, follows the investor. The country that supplies us with capital will reap a corresponding trade reward, and if the result is to hasten the flow into the Union of the fructifying stream of capital, broadening and deepening our whole industrial basis, we on our part can have no reason to complain.

Non-Ferrous Mining Industry: Departmental Committee.

The President of the Board of Trade has appointed a Departmental Committee to investigate and report upon the present position and economic possibilities of non-ferrous mining in the United Kingdom, and to make recommendations as to such Government action as may be expedient in regard thereto. The members of the Committee are Mr. H. B. Betterton, M.P. (chairman), Mr. H. F. Collins, Mr. J. Harris, Dr. F. H. Hatch, Sir Lionel Phillips, Bart., Mr. R. A. Thomas and Mr. James Wignall, M.P. The secretary is Mr. W. Palmer, Gwydyr House, Whitehall, S.W.1.

* * * *

The Late Dr. Schlesinger-Delmore.

It is with deepest regret we have to record the death, which occurred last Sunday night, of Dr. Jacques Schlesinger-Delmore, Ph.D., M.A., who came to South Africa 32 years ago, after a brilliant University career on the Continent. Upon his arrival he was engaged by the Government of the South African Republic, and was Government Analyst until 1893. He then founded the works of the New Transvaal Chemical Co., at Delmore, and was also mainly responsible for the building up of the South African Oil and Fat Industries near Durban. The late Dr. Schlesinger-Delmore was at once a scientist and a business man; and this unique combination of qualities he used to advance the industrial progress of his adopted country. He was, in fact, a pioneer of the local industrial movement, and the importance of his work in that direction cannot be over-estimated. In a notable tribute paid to the founder and managing director of the New Transvaal Chemical Co., a few years ago the chairman, Baron d'Erlanger, said: "Our company would not have been what it was, and what it is to-day, without Dr. Schlesinger-Delmore." "The Doctor" was buried during the week at Capetown, and his passing means the loss to South Africa of a notable and eminently lovable personality who has rendered yeoman service in laying the foundation of the industrial progress of the country.

* * * *

Frank Smith Diamonds.

Several enquiries have lately been received regarding the prospects of the Frank Smith Diamond Estates and Exploration Co., Ltd. They are best answered in the following quotation from the chairman's speech at the annual meeting four years ago: "As far as their possibilities are concerned, our general manager, in a supplementary report, which he made to us in September, states that he looked upon the mineral possibilities of the company's farms as a very valuable asset. On one farm, he said, he had exposed a diamondiferous fissure of most promising appearance, and on several other of the company's farms there are good indications which he considers should be followed up. The work done during the year has certainly confirmed one fact —namely, that the Frank Smith is a true diamond pipe. We have found that as we get deeper the mine becomes cleaner and contains fewer intrusions, and although we have been extremely unfortunate in being stopped by the war just when we began to get on our feet, I think the figures which we have been able to submit in our report undoubtedly indicate that, when work is resumed and the diamond market again becomes normal, the mine can be worked at a profit." The excellent quality of the stones from this fully-equipped mine, combined with the fact that the diamond market has in the meanwhile become more than normal, justifies the directors in now resuming operations.

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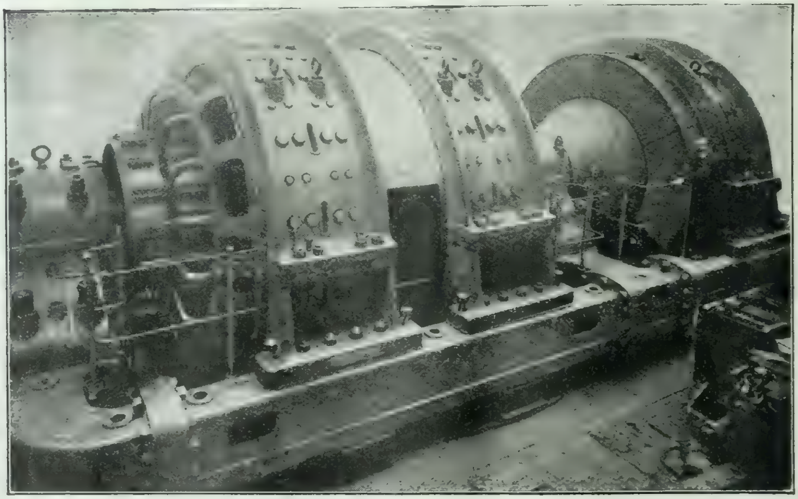

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BITUMINOUS SHALES IN SOUTH AFRICA.

Flotation of an Oil Corporation—Wakkerstroom Shales to be Exploited.

One of the greatest industrial problems of the world to-day is the problem of oil fuel. The diminishing output from wells has caused universal anxiety and has resulted in additional attention being given to bituminous shales, or as they are more popularly, though incorrectly, termed "oil shales." In the British Isles important development of bituminous shales is taking place in Norfolk, and it is a further indication of the importance of this industry that an amalgamation of the Scottish oil shale companies has been effected under the ægis of the Anglo-Persian Oil Fields. The United States does not generally lag on the path of industry, and it is therefore somewhat remarkable to find that only within the past year or two has America been awakened to a sense of enterprise in connection with the enormous bituminous shale deposits of the Western States. The shale industry in France dates back 89 years, whilst that in Scotland has been active for 60 years. In America, however, it was not until the summer of 1916 that the first adventures were made into this field of industry. Since then, however, the development of combustible shales has been energetically undertaken and the shale industry is considered to-day as likely eventually to prove the basis of one of America's greatest industries. South Africa also possesses extensive measures of bituminous shales, but so far they have lain fallow. Failure to locate favourable oil sites in the Union, and the pessimistic nature of Mr. Cuningham-Craig's report in regard to the chances of locating liquid oil, had a most depressing influence on all South African oil resources. But it should be remembered that Mr. Craig expressed himself favourably in regard to the "oil shale" deposits of the country. Mr. Craig, it will be recalled, was commissioned by the Union Government in 1913 to investigate and report on the prospects of finding oil in South Africa. He held out very little hope of oil wells being found, but was greatly impressed with deposits of oil shale which he inspected. He said in the course of his report: "All the evidence to hand at present leads to the belief that an oil shale industry has good prospects of proving successful, and I would urge that no effort should be spared to ensure that a fair test of its possibilities be made." The first serious effort to extract oil from combustible shales in this country falls to the credit of the African Oil Corporation, Ltd., a concern which has just recently been registered under the limited liability laws of the O.F.S. and in which well-known Johannesburg financial and business men are largely interested. This company has been formed to acquire rights over two farms in the Wakkerstroom district of the Transvaal, Kromhoek 76 and Virginia 37, and over coal and bituminous shale areas in the Pongola Bush district of Natal. The title to the farms is a mining lease for 60 years on a royalty basis, whilst the Pongola Bush asset is held under mining title from the Natal Government. Large deposits of oil-bearing shale occur on the farms Kromhoek and Virginia, and it is with a view to exploiting these and the coal deposits that the company has been formed. The farms Kromhoek and Virginia have been reported on by Mr. J. E. Mills Davies, consulting mining engineer, of Johannesburg, who has made a closer study of the potential oil resources of South Africa than any other mining engineer in the country. Mr. Mills Davies had the advantage of being temporarily associated with Mr. Cuningham-Craig during the latter gentleman's tour of inspection of South Africa, and it is upon Mr. Craig's views and the practical examinations and advice of Mr. Mills Davies that the corporation are relying for the technical success of the undertaking. In the course of a well reasoned and conservatively expressed report Mr. Davies states that the area of the farms is 2,463 morgen and the "main seam of oil shale" is estimated to cover an area of 1,400 acres and to contain 7,000,000 tons of shale. The outcrop measures from 4 ft. to 5 ft. in thickness and there are other seams of shale on the properties. Two seams of coal exist upon the farms and one seam has been exposed in two places, showing a thickness of 6 ft. of good coal. As to values, samples of oil shale taken by Mr. Mills Davies from the "main seam" have been analysed by Messrs. Littlejohn & Whitby, and showed results of 25 and 33·3 gallons of crude oil to the ton respectively. Mr. Mills Davies considers that the main seam alone should provide a life of thirty-five years on the basis of treating 500 tons per day, and on the basis of prices ruling in 1914 he values the result of refining 25 gallons of crude oil at 49s. 2d. The cost of treating oil shale in Scotland including the cost of refining the crude oil is 10s. 9d. per ton, but assuming a local cost of 25s. per ton, which is more than liberal, and the treatment of 500 tons per diem of say 300 working days per annum, the resulting profit at a moderate estimate of say 20s. per ton would aggregate £150,000 per annum, sufficient to pay very liberal dividends on any reasonable capital embarked on the venture. As to the volume of the local market, Mr. Davies points out that the value of the mineral oils and paraffin wax imported into the Union of South Africa during 1916 was over £1,000,000 at the place of production. This new industry deserves well of the country for it has all the elements of a successful undertaking. It has undoubtedly acquired what our American cousins term "the goods," it has secured the best technical advice obtainable, and it is backed by men of sound financial standing. But a word of caution in regard to the time factor of the enterprise is necessary. There is a very evident disposition in this country to discredit any undertaking which does not secure a rapid if not almost immediate success. Johannesburg especially has a population which favours "get rich quick" methods or no methods at all, and this attitude is not favourable to an undertaking which needs time and patience and money in "refreshers" of no meagre volume. Many good South African enterprises have been scotched because they did not yield the rapid dividends of a high-grade diamond venture or an ounce to the ton gold outcrop. The successful development of a bituminous shale is not going to be a matter of mere months, but if too much is not expected of the enterprise during the period of probation there is every reason to hope that in a few years' time we shall possess in this country a steadily expanding output of oil from combustible shales. For these reasons the preliminary operations of the pioneer concern will be watched with the closest interest and certainly with every hope of and for success. A further asset of this corporation is the large coal area acquired in the Pongola Bush. There can be no two opinions about the future of South African coal. Granted adequate rolling stock and sufficient labour, there is not a colliery in South Africa which could not well nigh double its production, and it is certain that when the rolling stock now on order by the Union Railways is delivered there will be a very great increase of coal output in this country.

Government Notice No. 1159 of 1919.

Notice is hereby given that it is the intention of the Government to declare open for pegging at an early date all claims which have lapsed under the provisions of the Gold Law, Act No. 35 of 1908 (Transvaal).

All persons claiming to have a right to renew any such claims under section *one hundred and three* of the said Act or under section *four* of the Public Welfare and Moratorium Amendment Act (Act No. 37 of 1917) are hereby called upon to prosecute their claims within three months from date hereof, at the Office of the Mining Commissioner concerned M.M. 3012/18.

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THE BASE METAL RESOURCES OF THE UNION.

Neglected Industries—Mineral Survey Needed—Help for Prospectors.

Dr. Wm. Versfeld, of the Government Chemical Laboratory, Capetown, has written an important memoir on our base metals, which the Government has now published. He says that the comparative neglect of base metal industries in the past is no doubt attributable to the large amount of attention claimed by the precious metals and gems of South Africa to the detriment of their more humble but no less useful "poor relations." The enormously increased demand for many base metals (with a corresponding increase in values), owing to the war, has stimulated interest in many deposits known to exist in South Africa. The establishment of a scientific and technical committee in connection with the Department of Mines and Industries is a big step in the right direction, and should lead to big results if there is no slackening of effort when the war is over. That many of the base metal deposits of this country can be very profitably worked has been proved and that very many more will be so worked in the near future is practically certain, but before the best results can be obtained some essential conditions must be fulfilled, namely—(1) the discovery of new deposits must not be left to chance or to incompetent prospectors; (2) there should be co-operation among the producers; and (3) the laws regulating the production of base metals (and others) should be so altered that the fleecing of the public by unscrupulous company promoters, who have no intention of ever working the deposits, may be prevented. There can be no doubt that capital has been badly scared in this manner. Of the few base metals that have been worked in this country, the most important is copper, which also happens to show the most easily recognizable surface indications, and is thus very easily discovered by chance. Numerous deposits of still more valuable metals are no doubt awaiting discovery, but require systematic prospecting by competent men, among who the average prospector can, unfortunately, not be classed. The time appears to be ripe for the institution of a mineral survey of the country, for encouraging systematic prospecting, and for giving assistance to prospectors or owners in the matter of advice as to the opening up and testing of deposits. It appears reasonably certain that a vast amount of mineral wealth is waiting to be unearthed. In Dr. Versfeld's book an account is given of the uses, occurrence, amount of production, and value of all the base metals produced or likely to be produced in the Union of South Africa, with the exception of iron and arsenic, which form the subject of separate reports. All details not of a practical nature have been omitted, and the report has been made as brief as possible. For the guidance of prospectors, it has been thought advisable to include a brief account of the conditions under which the metals occur in countries other than the Union. Dr. Versfeld's summary of his results is as follows: It will be seen from a perusal of the above that, speaking generally, the base metal industry in South Africa is still in its infancy. In a few cases, like copper and tin, the output has reached creditable dimensions, but in the majority of cases the metals have received scant attention. This is no doubt partly due to the extensive occurrence of more valuable minerals, like gold and diamonds, having practically monopolized the attention of capitalists. It should, however, be pointed out that many a medium-grade ore of a base metal is considerably more valuable than some of the lower grade gold ores being mined, and that the former are often more simple to work. On the other hand, they often require more preliminary work to prove their extent and richness than do our gold ores, and the result has been a lack of systematic work in testing known deposits and in attempting to discover new ones. The fact should not be lost sight of that, owing to the bed rock which forms the crust of the earth being so largely covered with soil, only a very small proportion of this rock has been examined by prospectors. This is particularly true in the case of an easily weathered rock like limestone, or dolomite, in which, in spite of this drawback, so many deposits of value have already been found. In this connection it is significant that a large number of deposits are being worked by driving into the side of a hill in which the mineral occurs. This cannot be said to be because minerals which happen to be of commercial value are more likely to be found in hills, but merely within range of the prospector's eye. Even in the dry parts of the country, like Namaqualand—and also in South-West Africa—where a very much larger proportion of the bed rock is exposed than is the case in other parts, and where prospecting is consequently comparatively easy, there can be no doubt that very many deposits await discovery in the rocks which are now covered with soil and blown sand as well as in exposed but unprospected rock. It should not be imagined that because a certain area of country is geologically mapped everything is known about the minerals occurring in that area. A geological survey should, however, prove of far greater assistance to prospectors than appears to be the case. Certain geological formations and certain conditions of occurrence of the various types of rock have been found more favourable than others for the occurrence of ore deposits. This would indicate the necessity of special attention being directed to certain parts of the country where these conditions prevail. To take one instance, a very striking peculiarity about deposits of ores of heavy metals is their very frequent occurrence at or near the junction of two different types of rock, of which one is intrusive in the other. A notable example is tin, but most other metals show the same characteristic. Full advantage does not appear to

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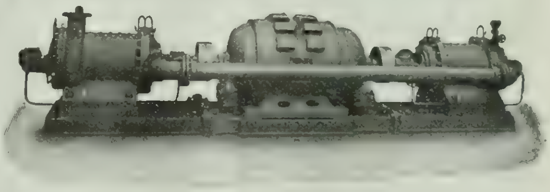

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have been taken of this fact in prospecting, and much work has still to be done, particularly in the north-western districts of the Cape Province, from the Van Rhynsdorp Division northwards, and in many parts of the Transvaal Province. Even the numerous intrusions of basic igneous rock are often associated with ore deposits, for example, the chromite of the Transvaal and the copper-nickel ore at Insizwa. For the reason that, in spite of comparatively little having been done in the past in the way of systematic prospecting, so many mineral deposits have already been discovered, the prospects of base metal mining in South Africa would appear rosy. In the case of low-priced metals or low-grade ores of any metal it may be necessary to work under a system of co-operation which will enable certain expenses to be distributed over several properties. Although the shortage of raw materials caused by the war is likely to last considerably longer than the war itself, it must be emphasized that the present prices are not normal. The war has had a most pronounced effect in stimulating the production of some metals like nickel, copper, tungsten, and molybdenum, so extensively used for war purposes, and also the output of magnesite and chromite. On the other hand, other metals have either gone down in price or the working expenses and freight difficulties have increased more rapidly than the value of the metal. This has resulted in the working of the low-priced metals like lead and zinc being stopped temporarily. There can be no doubt that the resumption of normal conditions will see these mines in full swing again. In order that prospectors, mining engineers, and company promoters may get all the available information on any particular metal, the establishment of a committee for the collection and co-ordination of information seems highly desirable. Such a committee should be in touch with the Imperial Institute, which is already in a position to supply a vast amount of useful information, not only on minerals but on all industries. A great deal of information is acquired at the various laboratories (Government and private) in this country in the course of the examination and analysis of minerals and the inspection of deposits, but this information appears to be pigeon-holed and the Government's right hand does not know what the left hand is doing. If all this information were properly indexed and easily available much capital and energy now being wasted on ventures that have several times been taken up and dropped could be saved and directed into more promising channels. The information collected by such a committee should, of course, include the market values of minerals and the best way of getting into touch with buyers. In addition, it seems desirable that there should be some system of Government control in the matter of company promoting, so that flotation may depend more on the quality of mineral deposits than on the plausibility of company promoters.

Commercial Aviation: Progress in Australia.

Considerable interest is being taken in business circles in Australia in commercial aviation. Consent to the registration of the following aviation companies in Australia has been granted by the Commonwealth Treasury: Aerial Services, Ltd.: Nominal capital, £10,000 in 100 shares of £100 each. Issued, £10,000. To undertake survey of aerial route between Australia and Egypt with a view to establishing larger company in Great Britain to carry on aerial service between the United Kingdom and Australia. Aerial Transport Co., Ltd: Nominal capital, £10,000 in 40,000 shares of 5s. each. Issued, £10,000. To make surveys and do all things preliminary to the establishment of an aerial transport system throughout Australia by a larger company. Aerial Co., Ltd.: Nominal capital, £20,000 in 20,000 shares of £1 each. Issued, £9,000. To give exhibition flights, instruct pilots, and popularise flying in New South Wales. Aerial Excursions Pty., Ltd.: Nominal capital, £10,000 in 10,000 shares of £1 each. Issued, £10,000. To give exhibition flights, train pilots, and popularise flying in Victoria. Aviation, Ltd.: Nominal capital, £50,000, shares £1 each. Issued, £20,000. To take over the agency rights for Australia in the sale and manufacture of aeroplanes and parts from the Curtis Aviation Company of America, to manufacture and deal in aerial contrivances, to teach aviation and to popularise flying.

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Kroonstad Coal Estate Company, Ltd.

NOTICE TO SHAREHOLDERS.

NOTICE is hereby given that the ANNUAL GENERAL MEETING of the Kroonstad Coal Estate Company, Limited, will be held at the Office of the Company, 9 and 11, Cheapside, Kimberley, on FRIDAY, the 26th SEPTEMBER, 1919, at 12 o'clock noon, for the following purposes:

(a) To receive and consider the Directors' Report and the Balance Sheet and Profit and Loss Account, which will be placed before the Meeting.

(b) To elect a Director in the place of Friedrich Hirschhorn, Esq., who retires by rotation, but is eligible for re-election, and has been duly nominated.

(c) To appoint Auditors and fix their remuneration.

(d) General business.

The Transfer Books and Register of the Company will be closed from the 19th to the 26th September, 1919, inclusive.

Dated at 9 and 11, Cheapside, Kimberley, the 3rd day of September, 1919.

By Order,
SALISBURY & BEATON,
Secretaries.

THE ADVANTAGES OF RAILWAY ELECTRIFICATION IN SOUTH AFRICA.

Important Report by Well-known Experts—A Comprehensive and Closely Reasoned Statement.

THE advantages of the electrification of certain sections of the South African Railways are set forth in considerable detail in a report by Messrs. Merz and McLellan, published this week. The sections considered are confined to four divisions. The first comprises the main line from Capetown to Touws River and suburban lines in the Peninsula. A tabular statement giving the cost of electrification and profit shows an estimated return on the net capital outlay of 12·1 on the main line section, 10 per cent. on the Simonstown branch, 8·1 on the Sea Point line, 30·5 on the Docks branch, and 9·7 in the Docks area. The second section comprises the Natal main line from Durban to Glencoe, whereon a return of 40·3 per cent. is anticipated, and the Glencoe Vryheid East branch, with a return of 12·5 per cent. The third section is the Witbank-Germiston-Randfontein line, where the return is estimated at 10·8 per cent., while the fourth section is the Delagoa Bay line between Witbank and Komati Poort, and here the return is expected to be 5·6 per cent. Thus the conversion of the main line in Natal is by far the most profitable. "This is to be expected" (says the report) "on account of the density of traffic and the very severe nature of the line, both of which tend to make the working of the line very difficult." The introduction of electric traction would avert the necessity for doubling the line, traffic on which is approaching the limit of capacity for a single track. A number of advantages to be derived from the conversion are enumerated. They include (1) higher average speed for long-distance passenger trains; (2) increase in weight and reduction in number of goods trains, with consequent improvement in handling traffic; (3) postponement of necessity for doubling track; (4) reduction of wear and tear on permanent way; (5) elimination of costs connected with the supply of water and coal for locomotives; (6) increased comfort for passengers and train crew; (7) abolition of expenditure in compensating farmers for fires caused by engine sparks. As it is out of the question to take in hand simultaneously the whole scheme of electrification, the report recommends steps for the conversion of the line between Durban and Glencoe to be put in hand immediately, then successively the Rand line, Vryheid East branch Cape lines, and finally that the Witbank-Komati Poort section should be electrified. The report goes into the comparative merits for the electrification by the direct current system, single phase system, and three phase system. It expresses the opinion that the direct current system is the best adapted to the general requirements in South Africa, and recommends its adoption. The narrowness of our gauge to some extent restricts the use of high voltage motors, but the report states that investigators have come to the conclusion that it is practicable and desirable that the average voltage of supply to trains should be three thousand. It is recommended that the overhead system of transmission should be adopted. For main line traffic it is proposed to use goods locomotives with tractive effort of 48,000 lbs., compared with 53,750 lbs. of the present Mallet articulated type, and passenger locomotives with tractive effort of about 30,000 lbs., which would be capable of hauling a 600 ton load up a gradient of one in sixty. In view of the fact that with electric working the most economical condition is obtained when a train travels at the highest permissible speed, it is proposed to increase very substantially the general speed of goods traffic. Provision will be made for a speed of 20 to 23 miles per hour up ruling gradients by goods trains, and 28 to 29 miles per hour for passenger trains, as tending to the most economical working, while for level parts provision will be made for an express passenger locomotive to haul 15 main line coaches at not less than 55 miles an hour. For suburban services, trains will be made up on the multiple unit system, each unit consisting of motor and trailing coaches. In this way during rush hours trains will be composed of four or five units (eight or ten coaches), while at other times two units might suffice. One feature of electrical working in South Africa is that trains running down long gradients would develop electrical energy, which will be utilised in driving returning trains up the gradients. This will greatly reduce the wear on break blocks, and enable higher speeds to be run, because with steam operation the speed of the train must always be maintained within the capacity of the air brakes to stop them. Arising from the increased speed and size of goods trains, much time will be saved at crossings, and there will be less need for side-tracking goods trains for passenger trains to pass. Comparison is made with the test made with a locomotive of the 12th class, with a load of about 1,200 tons, on a run from Witbank to Germiston, which covered the distance in 3 hours 45 minutes, exclusive of stops, whereas an electric locomotive would take 2 hours 30 minutes. If it should be decided to electrify the line through from Capetown to Johannesburg, it is not thought there will be any difficulty in covering the whole distance in 24 hours, provided the permanent way is maintained in first-class condition. There is no reason to anticipate that it will give rise to any increase in receipts, but the reduction in working expenses will be very considerable. Improvement in the suburban passenger service will consist in speding up the service, and in providing more trains to accommodate additional passengers. A further portion of the report deals with the supply of power for the electrification, and is full and detailed. It takes into account the possibility of electrification being extended beyond the sections already mentioned, and of current being generated for other than railway purposes. The report does not anticipate any substantial gain from the utilisation of water power for the generation of energy. It suggests for Natal lines the erection of power stations at Durban and Tayside, near Glencoe. For the Rand line, power might be taken partly from a station on the Great Olifant's River and partly from the existing network of the Victoria Falls Company. For the eastern line a power station should be provided at Komati Poort, and for lines radiating from Capetown there should be a power station near Capetown, and another at Touws River. At Capetown a combined station is suggested as capable of deeveloping power for railways, tramways and municipal requirements. In a detailed consideration of various sections, the report deals with acceleration and provision to be made for new rolling stock, the number of locomotives set free for use elsewhere, etc. It anticipates an increased average speed of about 25 per cent. on suburban lines in the Peninsula, and provision is made for increasing train miles from 623,000 per annum to 766,000, while on the Randfontein-Springs section the increased speed would vary from 16 per cent. between Johannesburg and Germiston to 34 per cent. for trains for the whole distance between Randfontein and Benoni. The proposed now service provides for an increase of 66 per cent. in train mileage on an ordinary week-day. There are a number of statistical tables attached to the report showing the proposed capital expenditure and saving in working expenses, etc.

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OCCURRENCES OF RARE METALS IN THE UNION.

[By Wm. Versfeld, B.A., D.Sc.*]

Very little attention has been paid to the deposits containing rare metals which are known to occur in South Africa. Some prospecting has been done in the pegmatites of Namaqualand, in which ores of tantalum, columbium, and lithium occur together. The large quantities of titaniferous iron ore occurring in the Transvaal and Natal have been examined, and the occurrence of monazite and orthite has evoked some mild interest. The following are some of the recorded occurrences of rare metals in the Union:

Cerium.—Allanite, also known as orthite, has been found in several localities in Namaqualand (*e.g.*, at Garies and further north), in the granite and schists of the Doornberg, at Petrusville (Fraserburg), and in the tinfields near Capetown. Bastnasite, a fluo-carbonate of cerium, lanthanum, and didymium, has been recently found in a tourmaline vein intersecting felsites on the farm Welgevonden (No. 777), Transvaal. It is associated with wolframite and cassiterite.

Columbium and Tantalum.—These metals were first discovered in Namaqualand in August, 1911, when the writer identified specimens of columbite and tantalite from the Richtersveld and other parts of Namaqualand. Numerous occurrences were subsequently discovered in the pegmatites of this granite area, and a considerable amount of prospecting was done. These minerals are associated with lithium, bismuth, and manganese minerals. The proportion of tantalum to columbium varies very considerably, and is roughly indicated by the specific gravity of the mineral, the highest gravity coinciding with the largest proportion of tantalum. The heaviest specimen examined had a gravity of 7·5, and was found to be manganotantalite, containing 82·4 per cent. of combined oxides of tantalum and columbium. It is likely that the amounts of tantalum oxide in this specimen would be over 80 per cent. Another specimen —part of a very large crystal—had a specific gravity of 6·85 and contained 82·2 per cent. of the combined oxides. When the gravity is as low as 5·4 very little tantalum is present. In other countries these minerals are known to occur in pegmatites, and to be associated with tungsten, manganese, titanium, uranium, and tin minerals, and also with monazite. In alluvial deposits it occurs with tinstone and wolfram. It is likely that important alluvial deposits will be discovered in Namaqualand, since the mineral is very heavy, and does not weather easily.

Glucinum.—This metal, also known as beryllium, occurs in the form of beryl in well-developed crystals, mostly in the old granites of the north-western districts of the Cape Province. The crystals are sometimes of enormous size, and in some localities they appear to be very numerous. Another glucinum mineral, eudidymite, has been found in the Clanwilliam district.

Iridium.—Small quantities of this metal are sometimes found associated with gold in some of the Johannesburg mines. In the Heidelberg district an interesting, if unimportant, discovery of iridium was reported in 1912. Samples from a small reef outcropping on the farm Kortnek were stated to contain 8 dwts. gold, 10 dwts. silver, and 3½ dwts. iridium per ton, and a trace of platinum. The occurrence of osmiridium in the New Rietfontein Mines has also been recorded. In view of the fact that osmiridium is found in alluvial tin deposits in Tasmania associated with chromite (and usually also gold), and that it is more plentiful where the creeks traverse a broad belt of serpentine, it would seem highly desirable that alluvial deposits in the neighbourhood of the Transvaal chromite deposits should be well examined.

Lithium.—Spodumene and lepidolite, two lithium silicates, occur with tantalite and other minerals in the pegmatites of Namaqualand. While it is unlikely that the ore could be worked for lithia alone, it is very probable that the various minerals found in the pegmatities will enable these deposits to be successfully worked.

Platinum.—Chromite deposits usually contain small amounts of platinum, and the South African chromites are no exception to the rule. A deposit at Kroonstad, near Rustenburg, contains varying amounts from 1 dwt. downwards. Many others contain up to 1½ dwts. Platinum, when found in other countries, is almost invariably associated with chromite and with the basic igneous rocks accompanying that mineral. The fact that platinum is very heavy, and is quite unaffected by atmospheric influences, makes it extremely probable that systematic searching will reveal the presence of this metal in alluvial deposits in the neighbourhood of chromite occurrences. In the copper-nickel deposits at Insizwa, in the Cape Province, platinum has been found in quantities varying from 12 grains to nearly 5 ounces per ton. It is unfortunately not uniformly distributed through the ore, an estimation of the value of which is thus rendered very difficult. If this deposit should be worked for the copper and nickel it contains, the platinum will no doubt be recovered as a by-product. The alleged discovery of large quantities of platinum near Grahamstown some years ago caused intense excitement for some time. The metal was, however, found to be of the phantom variety.

Radium.—Pitchblende, the ore from which radium is commercially prepared, has so far not been found in the Union, but other radio-active minerals have been found in the neighbourhood of the Transvaal and Swaziland tinfields. Little investigation has, however, been done.

Thorium.—The mineral monazite, though strictly a phosphate of the cerium group, is in demand, not as a source of cerium, but of thorium, and is paid for on the basis of its thorium content only. Monazite occurs in irregular, ill-

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* From Memoirs on the Base Metal Resources on the Union

defined veins in the red granite of the bushveld on the farm Houtenbek, sixty miles north-east of Pretoria, and at many other places on the margin of the bushveld complex. The monazite is associated with quartz, felspar, fluorite, molybdenite, and various iron minerals. The outcrops of the deposits are marked by honeycombed quartz, the iron pyrites having decomposed and left cavities. The reddish brown colour of the monazite renders it liable to confusion with the red felspar with which it occurs, but it is readily distinguished from the latter by its higher specific gravity, which is about double that of felspar. The veins at Houtenbek are up to 3 feet in width, and have been proved to extend to a depth of 30 or 40 feet. About a dozen veins have been found scattered over a distance of two miles. The monazite contains about 3 to 4½ per cent. of thoria. Prospecting work was done on the deposits about ten years ago, and there are dumps at the locality containing a considerable amount of monazite. It is stated that from these dumps probably about 6 tons of material containing 40 to 50 per cent. of monazite could be obtained by hand-sorting. The mineral occurs also in tin lodes on the farms Enkeldoorn and Vlaklaagte (Transvaal), in alluvial tin deposits in the Usutu Valley, and at Embabaan, in Swaziland, at Garies and other localities in Namaqualand, and in Van Rhynsdorp. Much of the South African monazite is reported to be distinctly radio-active. The amount of thoria found in the monazite from the Pretoria district, referred to above, namely, 3 to 4½ per cent., is somewhat low compared with the quantity found in other monazite ores of commerce. The Brazilian and Nigerian ores contain about 5 per cent. of thoria, while those of Ceylon and India usually contain nearer 10 per cent., and sometimes considerably over that figure. In 1910, monazite was worth about £5 per unit per cent. of thoria. Considerable quantities are being produced, the world's output being probably several thousand tons per annum.

Titanium.—Ilmenite (titaniferous iron ore) is of very extensive occurrence, being found in many igneous and metamorphic rocks. The large deposits of magnetic iron ores in the bushveld granite rocks and old schists have been found to be highly titaniferous, containing up to 14 per cent. of titanium. Should this type of ore be worked in this country more deposits will doubtless be discovered. Many specimens of ilmenite and other iron ores containing titanium, as well as specimens of rutile, have been found in various localities, but have attracted little attention.

Vanadium.—Minerals containing vanadium are fairly widely occurring, but are found only in small quantities. They occur in various types of rock, and are frequently contained in magnetite and other iron ores, being concentrated in their residues, chiefly in the basic Bessemer process. The slags from the Thomas and Gilchrist process in the Creusot ironworks contain nearly 1·5 per cent of vanadium, the quantity of the metal thus concentrated amounting to nearly 59 tons annually. In the Union a little vanadium has been found in the lead ores in the neighbourhood of Pretoria, but this discovery has not been proceeded with. On the farm Doornhoek, in the Heidelberg district, vanadate of lead occurs as small, red crystals in sandstone. In South-West Africa, too, vanadium occurs as mottramite (vanadate of copper) at Tsumeb West, Otavi district, and at Riettontein.

The Lonely.

The following are particulars of output of gold, etc., from the Lonely Mine for the month of August, 1919: Mill ran 717 hours; crushed 4,700 tons; fine gold recovered, 2,179·372 ozs., value £9,163 5s.; slimes treated, 4,700 tons; fine gold recovered, 3,840·192 ozs., value £16,148 17s. 2d.; total fine gold, 6,019·564 ozs., total value, £25,312 2s. 2d.; profit, £14,020 3s. 3d.

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THE WEEK IN THE SHAREMARKET.

A Busy Opening on London Buying—Easier Owing to Delayed Cables—Growing Activity.

The whole market has enjoyed greater activity during the week and Far East stocks have appreciated almost generally in price. The reason seems to be the receipt of good buying orders from London, in addition to satisfactory developments at almost all the Far East mines. Modder Easts continue to be the favourite counter, closely followed by the shares of the "C.M.S." group. Diamond, tin and coal shares are active, if not quite so popular, and the whole outlook indicates increasing activity and a broadening market. Fluctuations for the week were as follows:

	Fri. 12th.	Sat. 13th.	Mon. 15th.	Tues. 16th.	Wed. 17th.	Thurs. 18th.
African Farms	14 6*	14 3	14 3*	14 6	14 9	14 3*
Anglo-Amer. Corp.	30 0	30 0*	31 6	30 0*	31 3*	-
Apex Mines	7 0*	7 6	7 6*	—	7 3*	7 6*
Aurora Wests	—	8 6†		8 0*	8 6	8 6*
Brakpan Mines	73 0	73 0*	74 6	74 0	73 0*	73 0
Bantjes Con.	3 0*	3 1*	3 1*	3 0*	3 0*	3 0*
Breyten Collieries	5 0*		6 0*	6 0*	6 6*	7 0
Brick and Potteries	4 6*	4 6	4 0*	4 6*	4 6*	4 6*
British South Africa	22 6†	-	—	20 0*	20 0*	20 0*
Bushveld Tins	2 5	2 6	2 3*	2 6	2 6	2 6
Cassel Coals	32 6*	32 6*		32 6*	—	—
Cinderella Cons.	—	4 0*	-	—	—	—
City and Subs.	7 3*	7 3	7 0*	7 0*	7 0*	7 0*
City Deeps	57 6*	57 0	59 0†	56 6*	—	58 0†
Clydesdale Collieries	25 0*	25 6*	25 0*	26 6	26 6*	27 0*
Con. Investments	32 6†	—	-	—	..	—
Con. Langlaagtes	—	19 0*	20 0	19 6*	19 9*	20 0*
Con. Main Reefs	12 0†	11 6	11 3	11 9	11 0	9 10½
Con. Mines Selection	—	25 9†	26 0	26 9	27 0	26 0*
Coronation Collieries		65 0*		—	—	—
Coronation Freeholds	2 0*	2 0	2 0	2 0	2 0	2 0
Coronation Syndicates		—	4 6	—	-	4 0*
Crown Diamonds	11 6	11 0	11 0	10 6*	10 0	10 0
Crown Mines	53 0*	—			—	—
Crown Mines Deb.		—	-	—	£101	£100
Daggafontein Mines	24 6a	24 9	24 9	24 9	25 3	25 9
Durban Rood. Deeps	4 3†	—	5 0*	—	—	—
E.R. Coals	2 9*	2 10*	2 9	2 8*	2 9	2 9*
E.R. Deeps	1 0*	1 0*	1 0*	1 1*	-	1 2
E.R. Minings	—	26 0	26 0†	25 6		26 3*
E.R. Proprietaries	5 6	5 7*	5 7	5 7	5 7	5 6
E.R. Debentures	£65*	£65*	£65*	£65*	£65*	£65*
Eastern Golds	1 3	1 4*	1 3*	1 6	1 6	1 6
Frank Smith Dmds.	6 0	5 11	5 11	5 10	5 6	5 7*
Geduld Props.	53 9	53 6	53 3	53 0	52 9	53 6
Geldenhuis Deeps	8 0*	8 0*	—	8 3*		8 0*
Ginsbergs	—	—	—	1 9*		—
Glencairns	1 0*	1 0*	1 0*	1 0*	—	—
Glencoe Collieries	6 0*	6 3*	6 0*	6 0*	6 0	6 0*
Glynn's Lydenburgs	20 0†	20 0†	20 0†	20 0†	20 0†	20 0†
Govt. Areas	94 6	94 3*	94 0	93 0	92 3*	92 3
Jhb. Bd. of Ex.	32 6*	32 6*	33 0*	33 0*	33 0*	33 0*
Jupiters	4 6*	5 0†	4 7	4 9†	4 6	4 3*
Klerksdorp Props.	1 8*	1 8*	1 8*	1 8*	1 8*	1 8*
Knight Centrals	6 3	6 4	6 2	6 2*	6 0	5 10
Knights Deeps	—			8 0	—	
Lace Props	20 6*	21 0	21 3	21 6	21 0	21 6
Leeuwpoort Tins	30 6	29 6	29 6	31 0	32 6	31 3
Luipaardsvlei Est.	2 6*	—		. —	-	- -
Lydenburg Farms.	8 11	8 11	8 9	8 10	9 0	9 1
Meyer and Charltons	95 0†	95 0†	95 0*	-	92 0	93 0†
Middelvlei Estates	2 4*			2 6	2 6†	2 4*
Modder B.'s	172 6*	171 3*	172 6*	173 6	172 6	172 6a
Modder Deeps	44 0a	44 3	44 6	45 0	44 6	44 6a
Modder Easts	29 10½	31 3	32 9	33 3	32 9	33 6
Do. Opts. (3 yrs.)	10 2	11 3	12 6	14 9	13 6	14 6
Do. Opts. (4 yrs.)	12 1	12 11	14 9	16 6	15 3	15 10
Hume Pipes	25 0	24 6*	25 0*	25 0a	26 6	25 0
Langlaagte Estates				..	19 0†	19 0†
Natal Navig. Colls.	24 0*	24 0*	24 0*	24 6*		24 6*
New Boksburgs	1 6*	1 6*		1 6*	1 6†	1 7
New Eland Diamonds	28 6*	29 6	28 0*	29 0†	27 0*	28 3*
New Era Cons	11 3	11 4*	11 3	11 4*	11 6	11 4*
New Geduld Deeps	5 10	5 10	5 9	6 0†		
New Heriots	9 0†			9 0†	9 0†	
New Kleinfonteins	10 10*	10 9	10 9	11 0	10 3	10 6
New Modders	£28¼	£28½†	£28¼	£28*	£28¼	£28½†
New Primrose	2 6*					
New Unifieds	3 6*	3 6*	3 6*	3 6*	3 6*	4 0†
Nigels	6 9*				6 9*	
Nourse Mines	13 0†	13 0†	13 0†	12 6†	12 6†	12 9†
Princess Estates	2 2	2 2*	2 3	2 2*	2 2	2 2
Rand Collieries	3 6*	3 3*	3 5*	4 3*	4 0	[illegible]
Rand Mines	65 0†	65 0†		65 0†		
Rand Nucleus	2 0	1 11*	1 9*	2 0†	1 11*	2 0
Rand Select. Corp.	75 0*	76 0	76 0*	77 6	76 0a	80 0
Randfontein Deeps	6 0	6 1*	6 1	6 1	6 0	6 3
Randfontein Est.	21 3*	21 6*	22 0	21 9	22 0	22 3
Rooibergs	6 0	5 6*	5 6*	5 6*	6 0*	
Roberts Victors	11 9*	12 6†	10 6*	11 9	11 9	12 6
Roodepoort Uniteds	2 9*		-	3 0*		
Rose Deeps	8 0*		8 0*	12 0*	.	
Ryan Nigels	3 9*	4 0	3 9*	4 0*	4 0*	3 9
Shebas	2 6†	2 6†	2 0	2 0†	2 0†	
Simmer and Jacks	3 9*	5 6†	3 6*	3 6*	3 6*	4 0
Simmer Deeps	2 3*	2 0*	2 3	2 6	2 6	2 6
S.A. Breweries	37 0			35 0*	37 0*	37 0*
S.A. Lands	6 5	6 5	6 5	6 6	6 11	6 10
Springs Mines	56 9a	56 6	56 6	56 9	56 0	58 0
Sub Nigels	22 3*	22 0	22 6	22 6†	22 6	22 [illegible]
Swaziland Tins	19 0†		20 0†	—	20 0†	
Trans. G.M. 7st.	14 10½	14 9	14 9	15 0	15 0	15 0*
Van Ryn Deeps	76 0	75 9	76 0	76 3	76 0	76 6
Van Dyks	2 3*		—	2 3	2 6*	-
Village Deeps	14 3	15 0†	16 0	14 6*	—	14 0
Welgedachts	23 6*	—	25 0*	26 0*	26 0*	-
West Rand Cons.	—	4 0*	4 0*	-	5 3*	
Western Rand Est.	6 0*	6 9	6 9*	7 0	7 2*	7 0
Witwatersrands	17 0*	17 0	18 6	18 9†	19 0†	17 0*
Wit. Deeps	11 3*	11 3	10 9	.	—	10 0†
Wit. Townships	31 0†	-	31 0†	31 0†	31 0†	31 0†
Wolhuters	3 3	3 3*	3 4	3 4	3 3	3 3
Zaaiplaats Tins	7 7	7 10	7 10	7 8	7 9*	7 9
Union 5 per cent.	£104	£104	£104	£104	£104	£104½
New State Mines	30 0a	30 6†	32 3	34 6	34 6	34 3
South Van Ryns	9 0*	9 3	9 3	9 0	8 9*	8 3
S.A. Alkali	25 6*	25 0*	25 6	25 0	25 0	24 0a
Tudors	1 3	—	1 2*	—	1 0*	1 6†
Tweefontein Colls.	25 0*	25 0*	25 0*	25 0*	25 0*	25 0*
Union Corp.	18 6*	18 6*	18 6*	19 3*	—	—
West Springs	26 6	27 6	27 10½	28 9	28 0	27 9
West Springs Options	8 6	9 6	9 10½	11 0	10 7½	11 0

*Buyers. †Sellers xEx London aOdd lots

South African Coal Exports.

In the course of preparing our Special Coal Number, we have been at some pains to collect the following figures, which strikingly illustrate the wide field open to South African coal. During 1918 no less than 1,208,386 short tons of coal were shipped as cargo from South Africa, the value being £1,033,064, as compared with 539,462 tons, valued at £322,440, in 1917. The principal shipments, according to destination, were made to the following countries:

	1918. Tons.	1917. Tons.
United Kingdom	23,271	6
India	55,771	16,208
Ceylon	193,964	66,207
Aden	253,439	71,767
British East Africa	24,969	60,277
Mauritius	51,219	49,584
Straits Settlements	25,275	12,949
Egypt	123,815	48,289
Zanzibar	11,035	33,029
Madagascar	21,645	53,197
Other French Possessions	19,212	36,075
Greece	52,279	—
Portuguese East Africa	27,961	32,608
Portuguese West Africa	19,941	15,425
Argentine Republic	130,793	4,724
Uruguay	83,081	3,919

In addition, 1,276,333 short tons of South African coal, valued at £1,906,314, and 13,819 tons of imported coal, valued at £61,183, were loaded into bunkers at South African ports in 1918, as compared with a total of 2,348,084 tons, valued at £2,713,706, in 1917. In 1918, 667,001 tons of coal were shipped at Durban, and 511,354 tons at Delagoa Bay.

PERSONAL.

Mr. E. Birkenruth, of the Consolidated Goldfields, has left for Capetown on his way to England.

* * * *

Mr. R. Stourton, of the Mines Department, who has seen much service in France, has resumed duty.

* * * *

Mr. Edgar Pam, Manager of the Geldenhuis Deep, has returned from active service as Lieut.-Col. of the Royal Engineers.

* * * *

Mr. R. A. Lundquist, the Special Agent of the U.S. Department of Commerce, who has been on a protracted visit to this country, has completed his report on South African engineering and electrical trade possibilities.

* * * *

The list of certificates issued by the Mines Department for the fortnight ended 13th September, 1919, is as follows: Mine Overseers' (Metalliferous Mines): L. J. du Preez, A. L. James, B. H. Walker; (Collieries): E. Rudge.

Witwatersrand Deep.

Development at the Wit. Deep for the month of August showed the following totals and averages: Total feet, 306; footage sampled, 255; reef width, 32·1 inches; value, 13·0 dwts.; inch-dwts., 417.

Zaaiplaats Tin.

The Zaaiplaats results for the month of August, 1919, were as follows: Days run, 23; concentrates won, 9 tons; estimated loss for the month, excluding Government taxes and directors' fees, £1,852 5s. 5d.; capital expenditure, £826 6s. 8d.

CORRESPONDENCE AND DISCUSSION.

Railway Electrification.

To the Editor, *S.A. Mining and Engineering Journal.*

Sir,—You have doubtless remarked in Mr. Merz's report on the S.A.R. electrification the recommendation of "direct continuous current." This proves how everybody sees the thing in a small scale. It would simply *kill the electrification* of the long distance railways. Because of the conditions in England it is of course quite different. There it is a suburban railway throughout. The electrical engineers ought to take this up. I do not know of the proposed transforming on the machines, but this was abandoned in Sweden at once. I visited in 1913 three monophase railways in Sweden, Switzerland and France in all details, and I cannot see any objection to it or where any possible advantage can be gained by the direct current. Surely no other State in Africa would adopt it, and the possibility of inter-Colonial traffic is, it seems to me, most essential.—Yours, etc.,

"ENGINEER."

Swaziland Tin.

The following are the results of the operations of this company for the months of July and August, 1919: Concentrate recovered, 27·2 long tons; excess of expenditure over revenue (taking tin at £250 per ton and including adjustments £1,120), £525. This declaration is in accordance with the revised system, mentioned in the annual report recently issued, and covers practically two months' expenditure against one month's output.

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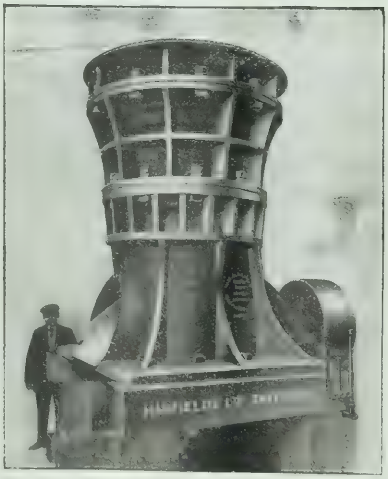

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ENGINEERING SECTION.

FURTHER ASPECTS OF THE KALAHARI PROBLEM.

[By August Karlson.]

I am greatly indebted to the *S.A. Mining and Engineering Journal* for having printed my articles on the Kalahari, and I am sure that the wide publicity given to this question will and has already served a good purpose. There are other questions connected with this problem, which are the iron, nitrogen and fertiliser industries, and which need also urgent consideration, and I am sure that these questions will also now receive attention. However, there is something to add to my articles for which I will be obliged if the *Mining Journal* will sacrifice a little more space.

(1) The Evaporation.

In Mr. Ingham's articles on the Vaal is shown the enormously increased evaporation for an increasing temperature of the water. In this country where, principally in the power, iron, nitrogen and fertiliser industries, the water has to be used over and over again, this evaporation of the warm water has an enormous importance. In the question of the large lakes it is absolutely capital. Mr. Ingham's table is in centigrades and depth of water evaporated per year:

Temperature Centigrade.	Yearly Depth of Evaporation.
19·6 degrees	6 ft. 5 in.
23·0 degrees	7 ft. 11 in.
28·2 degrees	13 ft. 0 in.
32·5 degrees	18 ft. 5 in.

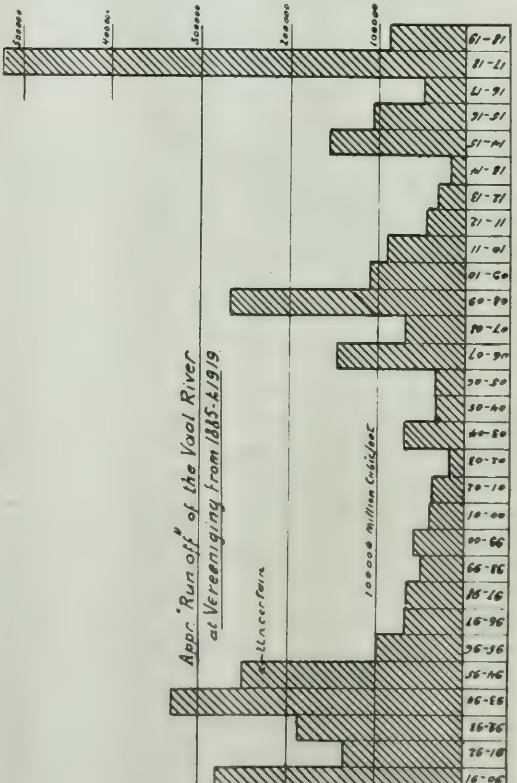
In my articles I have shown the enormous evaporation from the equatorial lakes: Lake Rudolf, 18 ft. 6 in.; Lake Tanganyika, depth 4,200 ft. and temperature 25 deg., 7 ft. 2 in.; Victoria Nyanza, much shallower than Tanganyika, 9 ft. 2 in.; and the very shallow Lake Tschad, 22 ft. 4 in. In this shallow lake the temperature will certainly reach 32 degrees. This proves how absolutely correct these summary calculations are, and how totally impossible it would be to maintain a large shallow lake without an enormous catchment of heavy rainfall. This evaporation is still multiplied by the transpiration of the reeds. It is therefore not in the re-establishment of the Kalahari Lakes that the solution of the problem can be found.

(2) Levels of Etosha Pan and of the Omurimba Ovambo.

Recently barometric levels have been taken on a motor car journey and under stable weather conditions, also corrected for temperature, and it was found that the level of the east corner of Etosha Pan was 3,520 ft. instead of 3,445 ft. as shown on the map. This is a difference of 75 ft. Professor Schwarz had also found a higher level than on the map. As shown by me, the level of the town of Humbe on the Cunene is 3,511 feet, and of Cunene itself, 22 miles above Humbe, 3,445 ft. The Cunene water can therefore not fill the Pan. It could not even run into it if the west side is not much lower than the east side. This is possible, but not to an extent of 100 ft. The Omurimba Ovambo at Tsintsabis, only 75 miles east of the Etosha Pan, is 3,862 ft. The fall towards the Pan on these 75 miles is therefore 342 ft., and this great fall is proved by the remains from the last flood. A small error is possible, but the variation of pressure cannot be very great in four hours. The spillway in either direction through the Omurimba Ovambo is therefore not possible and this is one of the main points of Professor Schwarz's scheme. The enormous evaporation and this evident fall of the Ovambo River show therefore that we must find another solution, which is irrigation on the old classical lines.

(3) Direction of Okwa River.

The Okwa River, rising south of the bend of the South-West African border at lat. 23 deg., does not flow towards the Makarikari as shown on the maps. This river after flowing north-east bends to the south and flows towards Lehututu, Malopolele, near Kanye, and to Molopo. On this subject every hunter and transport rider agrees. This means that the main watershed from Johannesburg to Okahandia is to the north of this river and very near to it, also that this river is the overflow from the old lake to the Orange River, exactly as I have supposed in my programme. According to the general gradient of the country this overflow should be at a level of 3,150 ft. and the Okavango canal from Andara is thus possible. The great length of this canal



is no objection. The great new aqueduct through Calabria (Italy), with branches, has a length of 1,600 miles. The first thing to do is therefore to verify this level and that of Andata.

(4) The Dry Period from 1896 to 1906.

The discharges of the Vaal given by Mr. Ingham are highly instructive. I have myself filled the gap from 1905 and 1910 by comparison with the gaugings of Vaal and Klip River higher up. It is also possible, by comparison with the levels of the river at Kimberley, to make up an approximate table from 1885. This table is represented on the attached graphic. This graphic shows better than figures the exceptional dry period from 1895 to 1906, and confirms absolutely the information of Professor Schwarz. There is no doubt that there is a pronounced cause of this greatly decreased rainfall, which on the graphic is accentuated by the greater run off for an increased rainfall. I agree, of course, entirely with Professor Schwarz that the moisture and the carbon dioxide have a great influence on the temperature as calculated by my countryman Arrhenius, but we must not mix up cause and effect. Professor Schwarz's own colleagues of the Cape University admit the influence of the Antarctic ice continent even on the rainfall of the Nile catchment and the meteorological station on Bouvet Island proposed by Professor Goddard, and by myself ten years ago, would be of an immense interest, as shown by the Antarctic station of the Argentine. I have myself tried to make comparisons with the records of this last station, but this work requires time. However, at the best we will by these stations know the general weather conditions a year in advance, but they will not give us the remedy for the dry years.

(5) The Increase of "Run-off" for a Higher Rainfall.

As said above, the greatly increased run-off accentuates most conspicuously the dry period. This increased run-off for a higher rainfall constitutes the whole initial condition of the irrigation in South Africa as it does in Algeria and in the drier Western States of America. But it is just of this condition that full account is not taken in South Africa. For an average rainfall of 40 inches Mr. Ingham finds a run-off of 35 per cent., for 20 inches 14 per cent., and for 25 inches 1·5 to 4·5 per cent. This enormous difference will be still more accentuated the more the veld is ploughed up for dry farming, and the agricultural census of 1918 shows that we are not far off from this cultivation of the veld if we are to prevent the enormous death rate of the cattle from starvation and if the main purpose of the veld is not to feed 1,300,000 trek oxen, of which each ploughs the amount of 5 acres per year. With a small even rainfall and the veld ploughed up there will not be any run-off at all. We see now that for the single year of 1917-18 the run-off for the Vaal was 15 per cent. more than for the whole ten years period of 1896 to 1906 put together. We must therefore, as in Algeria and in the United States, try to store as much as possible of the great floods to compensate for the deficit during the dry period, instead of basing the storage on the average small run-off which is bound to decrease even if we can help it up by the cultivation of the Kalahari. A great portion of the water will evaporate, but the evaporation will come back at least at "dew." If we now store all the water for a period as 1899 to 1914 with only one large and one small flood year in seven reservoirs above Palmietfontein (Lindeque) in the Transvaal and in the O.F.S., and this is quite possible, we can after evaporation distribute per year 53,000 million cubic feet, or per day 900 million gallons of water. If 200 million gallons are used for town water supply and industry, and I hope that all that will soon be required, it will remain 700 million gallons per day, which at 2 feet of water will irrigate 473,000 acres, supporting with assistance of cheap fertilisers 67,000 people. This is not much, and it is South Africa's best river. Official schemes, however, do not provide more than one-third of this amount, so where, without the Kalahari, is irrigation going to provide room for immigration? In a recent report of the Director of Irrigation these difficulties are recognised. This report goes so far as almost to warn people not to come to South Africa. As far as the difficulties of irrigation are concerned, this report is quite true. The only fault with it is that this was not pointed out ten years ago. The reservoir sites are not abundant, and if this had been shown it might have been understood that those sites which we have must be utilised to their fullest capacity. The greater Haartebeestpoort might then have received more consideration. Great reservoirs cost more money than small reservoirs; but if we do not keep in view the increase of the white population by building large reservoirs and by improving the rainfall by means of the irrigation of the Union and of Kalahari as well as by afforestation, we will build the small reservors ultimately for the natives, and for this purpose they will always be dear. This is a question where technical and commercial reasons must not alone be considered. The advantage of using the great equatorial rivers, Cunene and Okavango, becomes through this difference of run-off more apparent. The rainfall is there, at least in the northern portion, more evenly distributed from one year to another and, although the reservoirs in Angola and in North Rhodesia may have to be of a considerable size, it is possible to get 10 to 20 times more water out of such catchment than from those of the Union in the ordinary years. We will also influence the rainfall of the Union and thus improve the conditions of irrigation principally when agriculture will be more extended over the veld.

(6) The Difficulty in Storing the Floods.

The difficulty of storage of the floods caused by the silt is only apparent. Admitting the figures of Mr. Ingham of 42,000,000 cubic feet of silt for the Vaal at Kimberley, this is about 1,200,000 cubic metres per year. The great dams proposed on the Durance in France will deal with still greater amount and include gravel. This problem cannot be solved by any great gates, as for the Rand Water Board dam at Vereeniging. We would lose the water and only carry the mud from one reservoir to another. We have to adopt electrical dredging, distributing the fertile silt over the land, which can be done for twopence per cubic meter. To be able to do this at such a low price we must generate the electricity by utilisng for fertilisers the by-products of the coal. In Angola we would, of course, use the available water power. This will now cost for the Vaal £10,000 per year, paid by 500,000 acres of irrigated land, or fivepence per acre. When, as for example, at Haartebeestpoort, the power for the dredging could have been combined with the power for a great industry, the cost is less. When more reservoirs will be built in the Nile they may have to dredge also. In conclusion, I have tried to show the various technical difficulties. With determination it will not be impossible to overcome these difficulties and entirely transform South Africa by the blotting out of the Kalahari.

(7) The Electrification of the Railways.

In the report published by the S.A. Railways the consulting engineers, in pointing out the great advantages of the electrification with regard to greater speed and comfort of travelling recommend the "direct" current system. As pointed out in my articles the adopted system must suit the whole of Africa, except possibly small local suburban lines, and it is very doubtful if for the long distance railways the direct current system could be applied. The monophase system has in Sweden, Germany, Switzerland and France given such excellent result that I think the reason for a recommendation of the direct current system ought to be more particularly explained.

FOR SALE.

A number of Compound Iron Bunks, little worse than new, English make, very cheap.

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TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Mines Still Buying Very Little—Commercial and Agricultural Interests to the Front—Oils and Colours—Electrical Goods—Timber and Building Materials—Bricks and Cement—Iron and Steel—Trade Banks and Financing—The Hume Pipe Industry—The Labour Position.

Business in the mining material trade is fair, but obviously it is a long way from being normal, on account of the strikes and difficulties experienced in all parts of the world. The buying of the mines is still sluggish, but for general stores and spares it is improving from month to month in consequence of the various mines gradually absorbing their once very high reserves at the time of the Armistice. The manager of one firm stated that hitherto they had pretty much restricted themselves to the mining material trade, but since Peace was signed at Versailles they were launching out into general business, such as agricultural and all its various needs, such as implements, windmills, and the smaller motor machinery. This will enable them to keep their staff fully employed. Another firm says they had been quite busy one way and another for orders from the Belgian Congo, Rhodesia, Northern Transvaal, and even so far away as Portuguese East Africa. The coast ports also are sending orders to Johannesburg; one order was for about £3,000 worth of cables for electric light and power. The American indent trade has also been quite brisk, as Johannesburg merchants have been cancelling in Britain and ordering freely in America and Canada in consequence of the very high prices in Britain and the absolute absence of any guarantee as to when deliveries will take place. During the last ten days one very large American manufacturing concern has withdrawn from the market galvanised iron and tin plates. There are no orders given to America for light steel tram rails for the mines, because some time ago the Vereeniging Iron and Steel Factory got the contract from the mines. Canada is even a greater competitor for many lines than America. Under this heading it is worth recording that among the lines that were being readily shipped from Montreal to South African ports before the war were the following: Condensed milk, calcium carbide, hose, organs, chairs, roofing paper, wheelbarrows, windmills, shovels, tables, window frames and sashes, stoves, stationery, gates, yeast, wooden settees, and a variety of agricultural implements and machinery.

Oils and Colours.

According to the latest cable, linseed oil went down 2s. a gallon in London; the price here is for raw 95s. for 2-4's and 105s. boiled; white lead, British, 10½d. per lb. for 100 lbs. and smaller lots 1s. a lb; Canadian variety is 8d. per lb. wholesale; turps, 85s. to 90s. 2-4's, and 97s. 6d. 10-1's; castor oil (medicinal), 115s. 2-4's; ordinary mine ditto, 87s. 6d.; and mine (mineral), 47s. 6d.—50s.; olive oil is very scarce indeed, but it is expected that the first shipment from France will arrive shortly, which will be the first from there for about 1½ years, as our supplies, such as they were, have been kept up through Spain and Portugal. American best salad oil, 145s.; South American, 120s.; South African, 100s. The high price for the last-named is on account of the scarcity of monkey nuts, which have been bought for export. Business is not too bright in the oil trade, but there is always something doing. Holders are still trying to cut prices, more particularly the smaller men, who are usually very anxious to push trade. Oils for making soap are very scarce indeed; some of the smaller factories are feeling the pinch. Sperm oil is much cheaper in South Africa than in London on account of the shortage of shipping for export. It is understood that the large Durban soap firm is endeavouring to treat sperm oil as quickly and as well as possible. This is the reason that candles went down a penny per lb. last week.

Electrical Goods.

A persistent fate seems to attend tubing. As far as the ordinary tubing is concerned there seems to be nothing to complain of, as far as present stocks and immediate future consignments are concerned; the only fly in the ointment in this respect is the difficulty experienced by English manufacturers to supply the steel strip, one of the first essentials of tubing. That is a matter for the future. What, however, immediately concerns the electrical world of Johannesburg is the present dearth of screw (threaded) tubing, which is used underground. In lieu thereof contractors are being forced to use water piping at present. Other materials are coming in fairly freely. Lamps are still the same price, 21s. a doz. wholesale, 2s. each retail, but they are expected to increase in price very shortly. Country business, as well as town, continues very satisfactory. A prominent dealer mentioned that a large Capetown firm had wired him an order, amounting to about £3,000, for heavy cables, etc. He presumed that the materials were wanted either for the Tramways or the Municipality. However, he could not supply a tithe of the order, nor were his inquiries in Johannesburg, etc., of any avail towards executing the order. This instance, with others previously mentioned by us, of the coast applying to Johannesburg for materials, is an apt illustration of the present upside down condition of things commercially. Business for electrical material on the Exchange has been quiet during the week, as the mines have not been buying heavily just now. There are only small shipments of electrical goods on the water, but it is generally expected that in the near future heavy consignments will be dumped here from Germany at prices much below English, American and Japanese. As a matter of fact, it is an open secret that the

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dumping has already commenced, as the fact that materials already to hand, bearing the trade mark "Made in Holland," leaves little to the imagination as to the real country of origin.

Timber and Building Material.

There is still great activity in buildings, both in Johannesburg and suburbs, and now that the increase of wages to 3s. 6d. per hour has been arranged many tenders are being put out, therefore it is expected we shall have a long spell of prosperity in this line. The general feeling is that whenever it is possible to carry on building the owners will proceed as quickly as possible as they are tired of waiting for things to get cheaper. In this respect there are quite a number of building speculators getting into the field again, and are erecting three- or four-roomed residences. This with the anticipated advances to be made by the Municipality to assist the acute scarcity of houses is causing what some people already call a small building boom. Deals are 1s. 7d. to 1s. 8d.; floorings, 8½d. to 8¾d.; and ceilings, 6¼d. to 6½d. Galvanised roofing iron is still exceptionally scarce and is 1s 4½d. to 1s. 5½d. per ft.

Bricks and Cement.

The demand for bricks is so very great that all the orders cannot be supplied. They are up quite 10s. per thousand on account of the difficulty of obtaining road wagons for delivery in Johannesburg. There is no feed on the veld, and feeding stuffs are so expensive for the cattle. Tiles cannot be had for anything like reasonable forward delivery, say up to six months, as there are so many orders on hand that cannot be touched. There is practically no cement available, and contractors in urgent need pay 15s. to 17s. 6d. per bag to finish off a job. The contractors building a couple of houses of reinforced concrete at Orange Grove are stopped for the want of cement, and other jobs are hung up as well, so it is said.

Second-hand Timber and Iron.

The position in respect of the second-hand timber and iron yards is precisely the same as given in our last week's report. There are numerous inquiries, but owing to scarcity of materials orders cannot at present be executed. As an instance, one prominent dealer informed us that last Friday a buyer came in and offered him a £700 order, which, much to the chagrin of the former, had to be turned down owing to stocks not being on hand. Windows, doors, casements, etc., are still practically unobtainable, and although some timber is in stock it is, in comparison with the demand, like a drop in the ocean. Nominal prices are: English iron, 1s. 5d.; American, 1s. 3d. to 1s. 4d. Baltic timber is almost unobtainable and the poorer quality of deals are 1s. 6d per ft.

Iron and Steel

The special feature is the quantity of bar iron in South Africa still unabsorbed; as, for example, only the other day a parcel of bar iron was offered to a merchant at 22s. per 100 lbs. compared with the present landed charges of about 30s. Steel plates are firmer at about 40s. per 100 lbs. The manager of an American indenting house recommends the purchase of reasonable quantities of steel plates, as he anticipates that by the end of the year there will be a great scarcity, because he does not expect much coming from Great Britain. He reckons it will take the British makers quite another six months before they get into anything like reasonable trim. The imported bar iron, in small sizes, is for ¼in. 47s. 6d., ½in. 40s., ⅝in., 35s., ¾in., 33s., and 1in. upwards 32s. 6d. per 100 lbs. Steel angles, 4in. by 4in. by ½in., 38s. 6d. to 40s.; local, 2in. by 2in. by ¼in., 34s. As regards the under iron fittings for railway trucks, many of these are waiting for the essential parts requisite to finish off a large number of these trucks made in South Africa. Imported mild steel is 40s. to 42s. 6d. Shovels 67s. 6d. to 70s. per dozen. There is a lot of talk about profiteering. A representative of a large firm says there cannot be much now in the hardware line, as for example pumps costing landed here £72 10s. before the war are now £180. Locks that were 10s. are now 25s. Brass foundry was 25 per cent. off the listed price and now plus 75 per cent.

Trade Banks and Financing.

To-day there seems to be more money in South Africa than ever before, and we have had a plentiful supply of gold currency throughout the war period. We have a trade bank of our own with an initial capital of £500,000 with power to increase, and seeing our local banks are opening offices in town in every important street, our financial prospects seem excellent. The question, however, is the financing of export and oversea trade. The Chairman of the British Bank for Foreign Trade quotes approvingly the national action of Canada in granting credits to foreign countries which cannot pay cash down, so that the Canadian export trade may be developed, and recommends similar action by the Imperial Government to relieve the economic situation in Great Britain. As regards the assistance which the Canadian banks are giving to the exporter in establishing or increasing foreign business, this consists of the actual financing of his sales abroad and supplying information as regards the various foreign markets and the commercial standing of prospective customers. To this end the Canadian banks have established a Foreign Department that will furnish on request those endeavouring to find a foreign market for their products. Foreign sales so often involved long term credit that would unduly tax the resources of any bank, but thanks to the existence of broad discount markets in New York. London, Paris, etc., the banks can arrange to finance such long dated operations by selling or re-discounting, and thus avoid locking up their resources for long periods. As regards South Africa, in addition to its oversea trade, there is the great hinterlands up north.

NOW READY. **NOW READY.**

THE FAR EAST RAND.

Its Reefs, Mines and Share Values.

By W. E. BLELOCH,
Member of Lord Milner's Gold Law Commission, Author of "The New South Africa," "The Witwatersrand System," and Joint Author with A. E. O'Flaherty of "£1,000,000,000 for Us or Germany?"

With Maps and Photographs.
Introduction by C. J. Tutt.

15s. of all Booksellers.

The Book deals exhaustively with the reefs of the Far East Rand, their individual character, their stratigraphical position and extent, their economic importance, gold and profit values, and contains up-to-date information never before published. The photographs show up vividly the striking differences between the Far East Rand, Kimberley, the Van Ryn and the Nigel Reefs, and the Maps indicate the limits of the areas containing them.

The present values of shares on the basis of return of capital plus 10 per cent. interest per annum for the whole life of the mine (calculated on close estimates of its production in gold and profits) is worked out for each and every mine on the Far East Rand and the basis of the calculations is given for each.

A study of the values arrived at and of the gold and profits estimated will enable investors to judge on sound data what they are doing.

All interested in the mines of the Far East Rand should lose no time in ordering the book through their Booksellers. It may repay itself a thousandfold.

If any difficulty is found in obtaining the book, orders can be sent to the Author at 3 Transvaal Bank Buildings, Fox Street, Johannesburg, or to the offices of this Journal.

According to a farmer from East Africa, evidently information as to the strength of the markets in various parts would be very [illegible] and assist the running of the trade [illegible] very much better. The farmer in question is now in Johannesburg to purchase flour, sugar and other commodities to take back and make a trade profit on, but so far he cannot purchase sugar for export on account of the Government not supplying the necessary permit. He stated that he wanted to adopt the policy to save the immense exchange in transferring moneys from here to East Africa—something like 25 per cent.

The Hume Pipe Industry

From the chairman's speech at the annual general meeting held this week of the Hume Pipe Company, the capital, it will be observed, has been increased by the issue of 10,000 shares to the Concrete Construction Company and 5,000 shares subscribed for at £2 per share. In order, amongst other things, to complete the factory at Germiston it had been found necessary to borrow from the Central Mining & Investment Corporation, Ltd., a sum of £30,000 at 6½ per cent., of which at 30th June the amount of somewhat over £23,000 had been received. This sum, however, together with sundry creditors, £3,227 7s. 4d., was more than balanced by stores and materials, manufactured goods at cost, sundries and cash at bank, representing upwards of £10,000. Machinery, plant and buildings had been responsible for some £30,000, and a further £10,000 would have to be spent to bring the plant into working order. By the end of the present month five moulding machines would be in operation as against two heretofore working, and provided orders were to hand—of which there can be little doubt, judging from those already secured and those nearing completion—a bright future is in store for this company. The output of pipes manufactured by the company had increased from 13 tons per week at the beginning of 1919 to 85 tons per week at the end of June. In addition to pipes the company is now manufacturing columns, tiles, baths, troughs, pig weaners, silos and tanks, etc., and contemplates further manufactures in the future. It was announced that the company was now completing for the Rand Water Board a 6in. pipeline of 1,000 feet for a working pressure of 100 lbs. per square inch, tests of which at the factory had proved entirely satisfactory. A very pleasing feature also was that the articles manufactured by the company had in all cases proved very satisfactory. Indeed, several pipes had been tested to a considerably higher pressure than required, and tests of joints—which had been thought might prove a weak spot in the Hume pipe—had been carried out with the greatest success. In view of the satisfactory position disclosed at the meeting and of the continued success and increasing favour in which the Hume Pipe manufacturers are held by the technical advisers of our mines and public bodies, it is not difficult to agree with the Chairman that the future prosperity of the company is assured.

The Labour Position

The furniture trade strike is over after about six weeks' idleness, and now the employees have got pretty well what they originally wanted. It does seem a thousand pities that such a thing can happen—it does not matter in this paragraph at all events who is to blame. The result is the thing from a trade standpoint, which means a big loss to the Johannesburg community, as many orders went to the coast, as several houses here sent representatives who took the cash and purchased what they could get. And again a £4,000 order was cabled to America or Canada for furniture. All constitutional means should be taken before a strike is declared; one safe line of procedure is undoubtedly arbitration. It is something to be thankful for that the building employees have fixed up with the builders, which means prosperity to both sides instead of acrimony and many other ills. The difference between the building and furniture trade is that one cannot transport houses complete from the coast or anywhere else and just dump them down in the right spot, as they can furniture, therefore the judgment and diplomacy of an arbitrator might come in to some purpose.

The engineering shops are getting very short of work, evidently through the Low-Grade Mines Commission still keeping people in the dark as to what is likely to be done. Be that as it may, the manager of a leading shop in town states that if no more work comes forward from the mines, some of the artisans will either have to be put off altogether or on short time.

Municipal Council of Johannesburg.

Vacant Position of General Manager of the Gas and Electric Supply Department.

Applications are invited for the position of General Manager of the Gas and Electric Supply Department.

The duties and responsibilities of the position are as follows:—

Chief Engineer and Business Manager of the Council's Gas Department and the Electric Supply Department.

Chief Engineer of the Tramways Department.

Consulting Electrical Engineer for all Departments of the Council.

Supervision of repairs and maintenance of any of the Council's plant in other Departments when required to do so (excluding mechanical work of the Town Engineer's Department).

Technical supervision of the engineering plant at the Town Hall and Municipal Offices.

Adviser (in conjunction with the Town Engineer) on locomotion matters connected with any Department of the Council's service.

The position is graded £1,250-£1,500 per annum. The Council will use its discretion regarding the commencing salary; but in any case it will not exceed £1,500 per annum on monthly engagement. An allowance of £22 10s. 0d. per month is also provided for a motor car.

Applicants must state full name, address, age, present employment, qualifications and previous experience, whether married or single, and should give proof of fitness for the position, such as is recognised by full membership of the Institution of Mechanical Engineers (London) or the Institution of Electrical Engineers (London), or both. The possession of the Union Government Mechanical and Electrical Engineers' Certificates of competency will also be a recommendation.

The successful candidate will be required to pass a Medical Examination of fitness, and must become a member of the Johannesburg Municipal Pension and Provident Funds and contribute thereto in accordance with the rules.

Copies of not more than three recent testimonials should be enclosed with the application, which must be addressed to the Town Clerk, Municipal Offices, Johannesburg, and received by him not later than 12 noon on 1st October, 1919.

Attention is drawn to Standing Order No. 135, which reads as follows:—"Personal canvassing for appointments in the gift of the Council is strictly prohibited. Proof thereof shall disqualify a candidate for appointment."

LUTHER DAVIS,
Acting Town Clerk.

No. 289—9th September, 1919.

THE

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AND
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NOTICE.—The postage of this issue of the *S.A. Mining and Engineering Journal* is: South Africa, 1d. All other parts, 1½d.

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Notes and News.

The Rand's Gold Refinery.

After mentioning that the services of Mr. Kahan, of the Royal Mint, Perth, Western Australia, had been engaged for a year to advise the Chamber of Mines in connection with the establishment of a gold refinery, Sir E. Wallers at the Chamber of Mines' meeting stated that Mr. Kahan had arrived and, in conjunction with a small technical committee of the Chamber, was engaged in a preliminary investigation as to what was required. No time, therefore, was being lost by the Chamber in carrying out the project.

* * * *

An Object Lesson in Coal.

The Automobile Association of Great Britain, in conjunction with the Gaumont Film Hire Service, has prepared a film showing the waste and the possibilities of coal. The War Office has asked that a copy of the film may be shown to the various Army educational centres at home and on the Rhine. The film shows the possibilities of the various by-products derived from coal distillation, and its message is that a ton of coal will yield 2½ gallons of benzole spirit, sufficient to drive a motor cycle and side car 150 miles. The film was released for general exhibition on August 21.

* * * *

Diamond Cutting.

The proposal to establish a diamond-cutting industry in South Africa is the subject of criticism by Mr. Henri Polak in the organ of the Dutch Diamond Workers' League. According to the cables, Mr. Polak's argument is that it would be necessary to make provision in South Africa for a colony of something like 10,000 people in order to carry on the industry, and this would involve a heavy financial burden. He admits the possibility, however, of establishing an industry in South Africa, and advises vigilance on the part of Holland with the object of retaining the industry at Amsterdam.

* * * *

Randfontein Development.

The following cable was despatched last week to the London office of the Randfontein Central G.M. Company: "Struck Randfontein Leader in new north shaft at 3,210 feet vertical depth, dipping 60 degrees; value 11 dwts. over 48 inches stoping width. Nine complete sections sampled. This strike is over 1,000 feet incline distance below lowest level on reef at this section."

* * * *

Mozambique Cement.

The prospectus issued by the Mozambique Portland Cement Company has had a reception very gratifying to the promoters. Applications for shares have poured in from every quarter of South Africa, and the result reflects most favourably on the bold publicity policy that has been followed. The list, however, will remain open for a few days longer.

* * * *

Coal Freights.

Apart from any local difficulties in the way of increasing the output of South African coal to a sufficient extent to provide a surplus for export to Europe (remarks the *Times* trade supplement), the freight rates prevailing at present would not allow of the coal being brought to England at a competitive price. It is understood that the freight rate at the present time would be about £9 per ton.

* * * *

The Prime Minister on our Coal Resources.

For some months past this journal has been preaching a doctrine of development of our immense coal resources. We are certain that the material prosperity of this country is closely wrapped up in the question of expanding our coal trade. There appear, however, to be many sceptics as to the vast potential value of South African coal mines, and we therefore are glad to be able to print on our Colliery page the striking appreciation of the value of our coal areas from the lips of General Smuts.

The Wit. Deep and Mr. Miller.

We have received a copy of a report signed by Mr. W. Miller on the Wit. Deep, which certainly does not put the affairs of that company in a very promising light. Mr. Miller was appointed an alternate director of the Witwatersrand Deep Company's Board, and in a preface to his statement he writes that he "was interested to such an extent that he twice visited the mine." Whether two visits to a working property are sufficient to entitle anybody to appraise its results and prospects in accurate terms depends largely on the knowledge and ability of the investigator and the thoroughness of his investigations. Mr. Miller certainly appears to have gone pretty closely into the company's assets and prospects, and after reading his report one is forced to the conclusion that if the old Board did not succeed in placing the Wit. Deep on a successful basis the new directorate has not been able to improve matters. Mr. Miller is pessimistic as to the company's ability to reduce working costs. Basing calculations on certain known and presumptive factors in regard to life, ore reserves, tonnage and expenses, Mr. Miller estimates the value of the shares at 9s. 7·2d., which is about 1s. less than the current share quotation. Mr. Miller adversely criticises the air pressure and ventilation obtaining in the mine and advocates the abandonment of the western section of workings. It would certainly appear that from the point of view of the writer of the report under consideration the Wit. Deep has not taken a sudden change for the better under the aegis of the new directorate nor is it likely to.

* * * *

Agents Wanted in South Africa for American Manufacturers.

We have received a great many enquiries from American manufacturers desirous of appointing agents in this country to handle their products. The goods specially mentioned are electric welding machines, hollow set screws, unbreakable steel shaft hangers, high speed steel, agricultural machinery, spades, picks and shovels, timber, sheet packing, resistance and non-corrosive rods and wires, tractors, power hammers, milled cap screws, etc. Will any firms or individuals in the Union, Rhodesia or adjoining Protectorates, wishing to handle these lines, kindly communicate by letter with the Managing Director of this Journal, giving necessary references?

* * * *

The F.B.I.

Sir Arthur Steel Maitland, M.P., late Under-Secretary for Foreign Affairs, additional Parliamentary Secretary to the Board of Trade, and until recently in control of the Department of Overseas Trade, has accepted the invitation of the Federation of British Industries to become a member of its overseas committee. The Federation is to be congratulated (remarks the *Times*) on securing the advice and co-operation of Sir Arthur, who has thus shown his desire to continue on behalf of the overseas trade of the country the work which was so unfortunately cut short at the Board of Trade. The Federation is working very zealously to develop the export trade of the United Kingdom. In many countries of the world it is establishing its own Commissioners.

* * * *

The Effect of the Free Gold Market.

Speaking at the Chamber of Mines' meeting on the gold question this week, Sir Evelyn Wallers said that the first shipment that came under the new arrangement was that which went by the Edinburgh Castle. They had received advice that so far somewhat more than half of that shipment had been sold at an average premium of approximately 15 per cent. The advice as regarded the price obtained for the remainder of the shipment had just come to hand, and indicated that a somewhat higher premium had been obtained. But although the premium just now obtainable on gold was extremely satisfactory, there were several points that must not be disregarded. The first point was that one was unable to say to what extent and for what period a substantial premium on gold would be obtainable. The next point—and one of considerable interest—was the necessity for remembering that the general conditions which had resulted in the present position of the market in gold had in themselves a clear indication that the prices of the articles required for the production of gold would increase rather than decrease, and that the cost of living, and therefore also the cost of labour, would similarly increase. That was the other side of the picture which they must not neglect to consider; but, even so, he believed that the premium on gold would, to some extent, although maybe temporarily, improve on balance the whole industry's condition, and would, he trusted, make it possible for some mines that were in most precarious positions to-day to struggle on for a while longer in the hope of improvement in other directions. The greatest and most permanent help to the industry at the present time, added Sir Evelyn, would be the provision of an adequate native labour force.

* * * *

Research in South Africa.

In his presidential address to the members of the Chemical, Metallurgical and Mining Society, Mr. Jas. Gray, F.I.C., in dealing with "The Position of the Chemist in South Africa," said that the mineral industry of the Union is the accepted backbone of the country, and its magnitude was sufficient excuse for a plea for the establishment of what may be termed a "Bureau of Mines," to be conducted on lines similar as far as applicable in this country to the institution of that name conducted under the Department of the Interior of the United States of America. This Bureau was established to conduct, in connection with the public welfare, fundamental inquiries into the mining, metallurgical and mineral industries. Those who had followed its labours knew the importance and value of its investigations. In 1913 the money voted to it amounted to £132,400, of which approximately £70,000 was devoted to technical research pertinent to the mining industry. A similar institution in this country would be responsible for inquiries of a similar character, and would conduct research work in connection with problems such as miners' phthisis. This subject had been considered by many Commissions as well as Select Committees of the House of Assembly since 1904, but no real investigational work was carried out until 1912 when the Miners' Phthisis Prevention Committee, which consisted essentially of technical men, was formed. Commissions of necessity must consist of partisans, and the result was that majority and minority reports were the rule and not the exception. The pronouncement of a body such as the Bureau on this and similar subjects supported by a mass of scientific data, would be of such a nature that its finding must be accepted and given effect to by legislation. Hinged closely on the question of phthisis was the carrying out of the routine analyses necessary for the control of noxious gases and dust in mine air. It was surely anomalous to find that such an important and vital matter was left entirely to the mine authorities, who, however hedged round by regulations, would not always, in the records which they were obliged to keep, reflect the true ventilation conditions of the mine if that be bad. He said that advisedly. The regulations lay down definite figures for the permissible limits of noxious gases, but he had yet to learn of prosecutions for non-observance, at any rate within the last few years. The responsibility for the observance of the regulation lay with the Government and it cannot shirk its responsibilities by placing the onus on the mine authorities. This obligation was accepted in connection with the other regulations as was instanced by the appointment of mining and machinery inspectors. The duties of the Geological Survey could most appropriately come under this Bureau, and would result in a great co-ordination. In 1914 Prof. Stanley urged that the Government should make provision for the conduct of metallurgical investigations of refractory ores and instanced the facilities which already existed for this purpose. Such investigations could most suitably be carried out by the Bureau. As a rough outline of the method of working the Bureau, he would suggest that it be divided into routine and research departments, each under a deputy-director in charge of the Bureau. The appointment of the staff would create no difficulties, but the emoluments offered should be of a nature that really competent men would be obtained.

TOPICS OF THE WEEK.

THE LOW GRADE MINES AND NATIVE LABOUR.

As anticipated in these columns last week, the most notable feature of the interim report of the Low-Grade Mines Commission is the recommendation regarding the relaxation of the restriction on recruiting native labour from north of latitude 22° south. The report has been printed almost in its entirety in the daily papers, and its publication afforded the President of the Chamber of Mines an opportunity for comment at the quarterly meeting last Monday. The President pointed out that the expansion of South African industries which was anticipated in the near future would render still more inadequate the native labour supply, not alone of the mines, but of all existing industries, such as the coal mines, sugar estates, and also the farming industry, all of which, even under present conditions, were suffering severely from the shortage of native labour. As he had urged on many occasions, the only practical way of meeting the shortage was to abolish the arbitrary and unnatural restriction on the employment in the Union of natives from north of latitude 22° south, in regard to whom there was now no reason to anticipate any untoward health conditions. The Low-Grade Mines Commission has unanimously endorsed this opinion, and it is now the duty of the Government to recognise the imperative need for immediate action. The Commission, in its interim report, finds that the rise in the cost of production, due to the increased prices of materials and stores, and the higher wages paid to the European workers, together with the further handicaps imposed by the native labour shortage and reduced working hours, have brought the low-grade mines of the Rand to so critical a pass that it is essential that relief measures should be taken in hand as soon as possible if they are to be saved from closing down, in which event it is probable that some of them, at least, would never be reopened, and large quantities of ore would become permanently abandoned. In its final report the Commission proposes to deal fully with the marketing of gold, and the possibility of obtaining additional advantages from its sale. As relief measures which are held capable of immediate application, and which are accordingly recommended to the earnest attention of the Government and the other parties concerned, the report suggests: (a) greater co-operation between management and employees through Works and Joint Committees, (b) underground rearrangements to increase the effective working period of the natives, and (c) the temporary employment of natives from north of latitude 22° south, to supplement the present inadequate supply. With regard to the first of these recommendations, the fact is emphasised that already the discussion of points of difference with the employees, on working conditions, has had beneficial results. So far, however, such discussion has not extended to questions of efficiency. With regard to the second recommendation, the report shows that under the present system of utilising the native labour force, a considerable proportion of the period spent underground is not available for work. It is considered that the regulations and methods should be altered so that a larger proportion of the time might be rendered so available, and that a conference on the detailed proposals put forward to this end should have satisfactory results. Lastly, with reference to the employment of tropical natives, the Commission holds that to increase the native labour force would be " a certain and rapidly effective method of alleviating the position." Four suggestions are considered by the Commission in reference to native labour. The first is to prevent the richer mines employing natives, or only on surface work. But there is no reason, in view of the Commission, to suppose that the natives so displaced would be diverted to underground work on the low-grade concerns. The second suggestion, emanating in particular from native witnesses, is that for higher native wages. This is not seriously entertained by the Commission. On the third suggestion put before it, which is that for the removal of the colour bar, the Commission is not yet in a position to report, but in any case, it is pointed out, such a course would not appreciably increase the number of natives employed. Whatever may be the basis of labour or industry in the remote future, the existing basis, on which natives and Europeans are complementary to each other, must be accepted for the purposes of the present report. The fourth suggestion is unanimously recommended by the Commission, *i.e.*, a temporary modification of the prohibition imposed in 1913, owing to the then mortality—particularly from pneumonia—on the employment of natives from north of latitude 22° south. It is estimated that about 40,000 natives are required to make up the present shortage. The report does not recommend that so large a number should be recruited from the tropical areas at once. The medical evidence holds the mortality question now to be beyond the stage of experiment. As a matter of prudence, however, it is deemed not desirable to bring too large a number until opinion has been confirmed by actual proof. The medical witnesses have suggested 5,000 " as a suitable number for the purpose of arriving at a definite conclusion." The Commission suggests that if after six or nine months the mortality were found to be as low as anticipated, larger numbers should be introduced. The tropical natives would be allocated to mines with the most suitable accommodation. A general redistribution would then be possible, so arranged that the low-grade mines would chiefly benefit. Indirectly, the Commission holds, the benefit would be shared by South African industries as a whole. This, it must be remembered, is the unanimous finding of the many shades of opinion represented on the Commission; and the Government is therefore now in duty bound to put it into effect immediately.

The Forthcoming Mining Exhibition.

It is proposed to hold the fourth annual mining exhibition, under the auspices of the Chemical, Metallurgical and Mining Society and other bodies, from November 5 to 12. The exhibition is primarily intended for exhibiting devices and materials manufactured locally during the war as substitutes in place of supplies usually imported, and of other devices for use on the mines in connection with chemical, metallurgical and mining branches. It is desired to have a comprehensive exhibit for the encouragement of the Safety First movement. Space will be provided for exhibits of crude and manufactured mineral products of the country, and diagrams, models, photographs and plans of mines, works and plants, machinery and apparatus of recent date or connected with the early history of the mines are also invited. Should space permit, a few commercial exhibits may be accepted. No charge will be made for exhibits by the mines or by mine employees. Entries will close on October 21.

* * * *

T.C.L. Capital Reduced.

An order was granted by Judge-President de Villiers in the Rand Division of the Supreme Court last week confirming the reduction of capital by the Transvaal Consolidated Land and Exploration Co., Ltd., from £1,000,000 (divided into one million shares of £1 each, of which 971,214 are issued) to £728,410 10s. (divided into 971,214 shares of 15s. each). The reduction is to be effected by cancelling the whole of the 28,786 reserve shares by returning to shareholders 5s. per share in cash. The petition stated that the company had from time to time sold landed interests, and has set aside sums representing the cost of each of such properties sold. The sum of £242,803 10s., now proposed to be paid to shareholders at the rate of 5s. per share in reduction of the paid-up capital, will be taken from the moneys so accumulated. The directors considered that such moneys could not be treated as profits, and so ought not to be utilised in payment of dividends, but must be regarded as representing conversion of capital, and as the money was not required for the business of the company it was desired to repay it to shareholders by way of reduction of capital.

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MARKET PROSPECTS: THE REVIVAL IN KAFFIRS.

The Lull in Buying—French Selling Affects Local Quotations—Modder East Leads the Market.

After a lengthy period of stagnation the South African mining market has been galvanised into activity again. The causes of this revival of interest in Kaffirs are as many as they are varied and must be pretty well known to readers of this journal, for they have been dealt with at great length in numerous recent issues. In the first place there are the influences which have resulted from the cessation of hostilities in Europe, of which the relaxation of trading restrictions between Johannesburg and London is the most important. Secondly, there are numerous causes which are attributable both to the prosecution of the war and the declaration of Peace, the selling of gold in the open market and at a premium, the high prices obtaining for diamonds, coal and tin, and the plight into which the low-grade mines have fallen as a result of war costs, a plight which has resulted in the important recommendations of the Low-Grade Mines Commission. Thirdly, there are the factors associated with the development of the mines themselves, of which the outstanding feature is the continued good showing of the expanding Far East Rand, the poverty of the Central section, and the prospect of improvement on the extreme Western area. There are numerous other matters which have conduced to the present activity in South African shares, but all of them are subsidiary in some degree or other to the three primary causes stated above.

Overseas Capital.

The end of the great war witnesses the world in a state of appalling topsy-turveydom, politically, socially, financially and industrially. Some of the problems resulting from the struggle appear to be well nigh insoluble. Money is plentiful, but the burden of taxation in Europe is colossal and it is not strange to observe a disposition on the part of people in England and on the Continent to invest their wealth or their savings outside torn and troubled Europe. No other portion of the British Empire has felt the influences of the war so little as South Africa. This country has emerged from Armageddon with a prosperity in marked contrast to the well nigh bankrupt condition of most other countries, and it is only reasonable to suppose that more and more overseas money will find its way into South Africa.

It is impossible to compute in exact dimensions the relative values of the existing premium for gold, the relaxation of Treasury restrictions on dealing with London, and the prospect of obtaining tropical labour, as against the new Provincial and phthisis taxation and the certainty that costs of living, and therefore of production, will rise in keeping with the advance in the price of gold. But the market certainly appears to take the view that the bull points of the situation outweigh the bear factors, and without any attempt at a close appreciation of the effect of these rival influences it seems clear that the gold mining industry's outlook has been bettered substantially during the past few months.

The Fall of the Franc.

That at any rate is the view taken by the Stock Exchange, which is after all only the reflex of public opinion. On the average South African mining shares have appreciated to the extent of something like 25 per cent. in the past four months, and the general opinion is that further advance is to be looked for. South African shares, like all other stocks, however, are subject to the caprices of world trade finance, political changes, rates of exchange and discount, and a host of extraneous factors which are entirely beyond the ken and control of one man or syndicate of men. A revolution in Italy, say, might knock a third of a million off the market valuation of New Modders in a few hours. The value of the ore in the mine would not be influenced by such an event. The company's working profit would not be effected. But the influence of a revolution in Italy could quite understandably weaken the Rand's leading stock by "a quarter" or more through the extraordinarily complex channels of international and inter-Colonial finance which are so interwoven and interdependent with almost amazing complexity.

Modder Easts.

We have seen something of the sort happen within the past ten days. Just when London was purchasing South African stocks and particularly the newer Far East Rand shares, just when everything seemed to point to a continued strong upward tendency in Kaffirs, the Johannesburg market went easier without any apparent reason. Paris, it was reported, was selling. But why? It was only at a later date that confirmation was forthcoming. Trade returns show that France's imports have been eight times as great as her exports during the last six months. On realisation of this the franc fell sharply in exchange value and caused French shareholders to realise securities. Liquidation affected London, and this in turn reacted on Johannesburg. Note the influence on an individual stock. A week ago Modder Easts were quoted at 34s. To-day they have been dealt in at 31s. with debentures and options correspondingly weaker. Modder Easts have come to be the barometer of the local Rialto during the past few weeks. The whole market has been practically riding on the back of Modder Easts, and contemporaneously with the decline in Modder Easts the majority of Rand gold stocks have eased away to the prices of a fortnight or three weeks ago. The Jewish holidays have further tended to restrict business and for the moment there is a lull in market activity. Few people, apart from the professional bears, however, are inclined to the view that the set-back is anything more than temporary. Modder Easts, for example, should soon top the price at which they stood at in London ten days ago, which was 35s. 9d. The report for the quarter ended with September 30th, which should be published in two or three weeks' time, will disclose an eminently satisfactory state of affairs. It is anticipated in knowing quarters that on ore reserve of between a million and a million and a quarter tons, assaying nearer nine than eight pennyweights, will then be divulged. As to the company's milling policy there are contradictory rumours afloat. Some savants have it that the Board's intention is to employ the Apex mill temporarily, just as the Wit. Deep tried the old Balmoral plant in its early days of crushing. Others deny this report. In any case it would be a further distinct feather in the cap of Corner House if they could not only establish a big and payable mine but also bring it to the milling stage within three years from the date of flotation—and three most difficult years at that. It is generally recognised that the rise in Modder Easts has given the main impetus to the local market. Intentionally or unintentionally, the Central Mining and Investment people have given the local public a rare chance to make money, particularly through the medium of the debentures, and a further appreciation in the latest addition to the Modder family will mean a general advance in the favourite stocks, particularly in the "C.M.S." group, the shares of which enterprise should shortly be listed on Wall Street. And in the best informed quarters such an advance is believed to be pending.

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THE YEAR WITH THE NOURSE MINES.

A Nominal Profit Earned—Increased Ore Reserves—Scheme to Develop the South Eastern Section.

At the Nourse Mines last year only a nominal profit was earned, chiefly due to the influenza epidemic which occurred at the end of 1918, the increased costs brought about by the war, and scarcity of native labour. The ore reserves at the end of the year amounted to 1,526,100 tons of an average value of 6·8 dwts., an increase in the tonnage of 12,500 tons, with no change in the value when compared with the previous year. For some time past the directors have had under consideration a scheme for the development and equipment of the south-eastern section of the mine. It has been decided to utilise the eastern south Nourse shaft (No. 1) and to re-equip it for hoisting. The depth of this shaft will be increased by 1,000 feet to a depth of about 3,500 feet, and in course of time all hoisting operations will be concentrated at the two south Nourse shafts and eventually result in considerable economy. The estimated expenditure in this connection will amount approximately to £120,000, of which amount some £90,000 will be required over a period of two years and the balance when the shaft becomes a producer in place of the older and shallower shafts. Against this expenditure it is estimated that £35,000 may be realised by the sale of surplus machinery and plant no longer required on the mine. The working profit for the year amounted to £11,291 10s. 11d., to which has been added £4,102 3s., being the difference between sundry items of revenue and expenditure enumerated in the working expenditure and revenue account, making a total profit of £15,393 13s. 11d. This sum has been carried to appropriation account. The appropriation account has been further credited with forfeited dividends, adjustment of taxes, credit on capital account, and with the balance at the commencement of the year stands in credit the amount of £155,337 2s. 8d. This balance is made up as follows: Shares and interests in co-operative concerns, £9,016 5s. 6d.; stores and materials, etc., £49,008 17s. 7d.; sundry debtors and payments in advance, £4,839 5s. 9d.; total, £62,864 8s. 10d.; net cash and investments after allowing for liabilities, £92,472 13s. 10d.; total, £155,337 2s. 8d. At the end of the year the value of the stores on hand showed a reduction as compared with the end of the previous year; and it is hoped to further reduce the value of stores held with the view of returning, as closely as possible, to the position that existed prior to the war. Mainly with the object of ensuring the supply of the company's requirements of lime, an interest has been acquired in the Northern Lime Company, Ltd., which is reflected in the balance sheet submitted. Owing to the small profit earned during the first six months of the financial year, the directors decided not to declare a dividend in December last; the same course was followed for the half-year ending 30th June, 1919, in view of the disappointing profit earned for that period and the programme of capital expenditure sanctioned by the Board in May last for the development of the eastern section of the mine referred to in this report.

CONSULTING ENGINEER'S REPORT.

In the absence of Mr. H. Stuart Martin on leave, Mr. H. Meyer endorses the report of the manager, Mr. S. Beaton, dealing with operations for the year ended June 30th, 1919. Mr. Meyer writes: The hope expressed last year, that the native labour supply would increase, and thus enable the mine to give a better return of profit, has not been realised. The native complement of the mine is 5,446, whilst the average number of natives employed by the company during the year under review was 3,850—equivalent to 70·7 per cent. of the complement. Under the circumstances prevailing, it has not been possible to operate the reduction plant to its full capacity, viz., 600,000 tons per annum, the tonnage milled for the year being 457,800 tons. The anticipated improvement in yield was obtained, it being 11d. per ton milled higher than in the preceding year. Working costs, however, owing to the higher scale of wages, war allowances, shorter hours, higher price of stores, increased 2s. 11d. per ton milled—this in spite of the most rigid economy and care. The net result of the year's operations was a working profit of £11,291 from a total output of gold of £619,229, or 1·8 per cent., a hopeless return from a mining proposition of this magnitude. Taking circumstances into consideration, development was well maintained, the footage of 15,009 being an increase of 3,263 feet. The major portion of this work was done in the south Nourse section with, on the whole, satisfactory reef disclosures. The payable tonnage developed for the year totalled 310,300 tons of an estimated value of 7·1 dwts. per ton. The re-estimation of the ore reserve results as follows: Main Reef, 128,900 tons, value 5·9 dwts.; Main Reef Leader, 778,000 tons, value 7·1 dwts.; South Reef, 619,200 tons, value 6·7 dwts.; total, 1,526,100 tons, value 6·8 dwts. The estimate is based on stoping widths averaging 61, 48, and 52 inches in the three reefs respectively. The position, compared with the previous year, is practically unchanged, both as regards tonnage and value. The mine is in good order and condition, with numerous points of attack for increased production. The programme of re-opening and deepening the old eastern shaft of the south Nourse, to which you have given your sanction, will be pushed on as rapidly as circumstances will permit during the year. It is very difficult to attempt any forecast for the current year. At the time of writing, prospects are not encouraging, additional burdens being the rule rather than the exception. Unless the labour supply improves, the margin of profit will be almost negligible. The manager and his staff have done everything possible to deal with the numerous and disheartening difficulties with which they have been faced.

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Telegraphic Add: "ROPES."

Manager's Report.

The manager, Mr. S. Beaton, writes, *inter alia*, as follows: The working costs for the year ended June 30th, 1919, were 26s. 7d. per ton, as compared with 23s. 8d. per ton for the year ended 30th June, 1918. The reduction of 13,200 tons in the tonnage milled and the increased costs are due to a great extent to the reduced working hours and the amount of natives' time wasted through carrying out certain mining regulations which it is felt could well be modified with advantage to all concerned. Evidence on this point has been given before the Low-Grade Mines Commission. The influenza epidemic during November and December seriously affected the costs through the decreased production of ore. The total working expenditure shows an increase of £50,200, the extra cost of stores being £18,364, white wages £17,907, and coloured wages £9,468. The increased cost of stores is due to the war conditions, and as yet no reductions can be noted—in fact, in some instances prices have increased since the signing of the armistice. Although there was a slight improvement in the number of native employees, the increase was too small to be really useful, and the supply fluctuated to such an extent that it was impossible to maintain a good efficiency. The continued use of Jack Hammers has been of material assistance. Main Reef: There was a slight gain in the ore reserve. Main Reef Leader: The tonnage and width values have been maintained in this reef; good values and fair sized blocks continue to be opened out in the south Nourse section. South Reef: The policy of investigating all South Reef blocks has been maintained, and further valuable blocks were opened out. Some good blocks of South Reef are being developed in the No. 4 section, or what is now No. 1 section, south Nourse. Shaft sinking: We have been unable to continue sinking the south Nourse incline during the war, as it was impossible to obtain electric cables to increase the pumping plant to its full capacity. These cables are on order, and should shortly be delivered. A sub-incline has been sunk from the 24th level, south Nourse, and is now at the horizon of the 26th level. This shaft is in a very good chute of ore, and will open out the western section rapidly. No. 1 shaft, south Nourse: The equipping and sinking of this shaft a further 1,000 feet has been commenced, and it is anticipated it will take three years to complete. The opening of this shaft will enable the ore to be hauled in one lift from the 28th level, and should decrease the operating costs in this section of the mine. Central section: Owing to our present high working costs, no work has been done in this section. West incline: Owing to the shortage of native labour, working had to be suspended in this section. All the plant, both surface and underground, has been maintained in good order. A considerable quantity of old machinery has been sold, and continuous efforts are being made to dispose of excess plant. Safety and health conditions continue to receive attention, and the mine won the Safety First prize (Class "C") for the best reduction in accident rate last year.

In the list of companies recently published appears that of the Scotia Talc Mine, Ltd., Johannesburg, formed to undertake mining for talc in the Barberton district, with a capital of £12,000. The managing director is Mr. J. Malcolm.

Companies Struck Off.

Notice is given, in accordance with Section 196 of the Companies Act, 1909, that the names of the undermentioned companies have been struck off the register and that those companies shall be dissolved:—No. 860, Bells Asbestos Agency, Ltd.; No. 3967, Concordia Lydenburg, Ltd.; No. 4694, John Macaulay, Ltd.; No. 5283, Skilpat Tin Mines, Ltd.; No. 5555, The Lees Manufacturing Company, Ltd.

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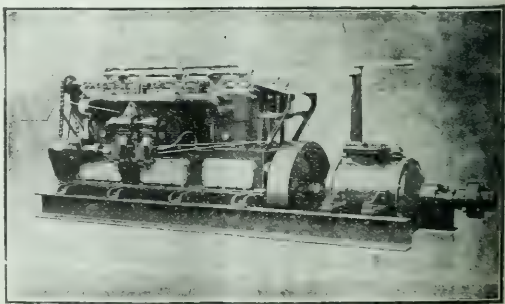

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THE OUTLOOK FOR THE CONSOLIDATED MAIN REEF.

Unsatisfactory Development—Improved Yield—Increase in Working Costs—Reduces Profits.

At the Consolidated Main Reef the tonnage crushed for the past year was higher than that of the previous year, and the yield per ton improved by 1s. 4d. Working costs, however, show the heavy increase of 3s. 8d. per ton, the reasons for which are stated in the consulting engineer's report, and profits consequently dropped from £151,879 in 1917-18 to £93,715 in the year ending 30th June, 1919. The directors draw attention to the remarks of the consulting engineer regarding the development of the mine, which, though a considerably increased amount of work was done during the past year, has been unsatisfactory. The ore reserve shows a reduction of 225,000 tons in quantity, with an increase of ·3 dwt. in value. Development of the claims leased from the Bantjes Consolidated Mines, Ltd., is making progress, but as yet no stoping has been done in this area. A summary of the terms and conditions of this lease was given in the directors' report for the quarter ending 30th September, 1918, and reference was also made to it at the last annual general meeting. To the working profit for the year of £93,714 11s. 5d. has been added £2,418 3s. 1d., the difference between sundry items of revenue and expenditure detailed in the working expenditure and revenue account, making a total profit of £96,132 14s. 6d., which has been carried to appropriation account. This amount, together with £166,764 19s. 7d. unappropriated at the commencement of the year, and forfeited dividends, £90 13s. 10d., making a total of £262,988 7s. 11d., has been dealt with as follows: Capital expenditure (net), £11,396 7s. 2d.; Government taxes, £11,808 10s. 4d.; Provincial (Transvaal) taxes, £2,772 7s. 5d.; balance of unpaid calls, Main Reef East and Main Reef Deep, written off, £452 19s. 8d.; dividends Nos. 21 and 22, £62,380 2s. 0d.; total, £88,810 6s. 7d.; balance unappropriated at 30th June, 1919, represented by cash, investments, and cash assets, less liabilities, including mine development suspense account, £11,328 6s. 6d., £174,178 1s. 4d.; total, £262,988 7s. 11d. The net cash and investments, after allowing for liabilities, including mine development suspense account, £11,328 6s. 6d., amounts to £63,677 7s. As it has not been possible to recover the amounts due in respect of the two items, viz., Main Reef East and Main Reef Deep shareholders' unpaid calls, totalling £1,823 10s., which have been outstanding for a considerable number of years, the shares in this company due in respect thereof have been sold. The proceeds of the sale and the dividends accrued amounted to £1,370 10s. 4d., and the balance, viz., £452 19s. 8d., has been written off to appropriation account. The practice adopted in the previous year of making provision for the shortage in the development footage by a monthly charge to working expenditure was continued until the end of April last, when the charge was discontinued, as it was considered that sufficient development footage was being accomplished, the average for the months of May and June being 1,938 feet. At the end of the year this account was in credit to the extent of £11,328 6s. 6d. Mainly with the object of ensuring the supply of the company's requirements of lime, an interest has been acquired in the Northern Lime Company, Ltd., which is reflected in the balance sheet submitted. Two dividends, Nos. 21 and 22, of 2½ per cent. each, absorbing £62,380 2s., were declared, free of Union of South Africa Income Tax, by the directors during the year. Progress has been made with the reorganisation scheme for operating the two mines as a more compact unit. The greater part of the rock from the lower levels is now being hoisted through the two main vertical shafts, Nos. 3 and 5. A considerable amount of work has been done in equipping the subsidiary incline shafts for dealing with rock at depth and also upon the concentration of the pumping arrangements for each of the two sections of the mine at No. 3 shaft and No. 5 shaft.

Consulting Engineer's Report.

The consulting engineer, Mr. E. H. Clifford, writes: I beg to submit my report on the operations of your mine for the year ended 30th June, 1919. In comparing the results with those of the previous year, the principal features of which are tabulated below, it should be noted that the earlier figures include nine months of the working of the Consolidated Main Reef Mines and the Main Reef West and three months of the Consolidated Main Reef Mines previous to the amalgamation, while the latter cover twelve months' work for the combined companies. Tons milled, 1918 539,760, 1919 570,710; total yield, 1918 £760,496, 1919

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The Book deals exhaustively with the reefs of the Far East Rand, their individual character, their stratigraphical position and extent, their economic importance, gold and profit values, and contains up-to-date information never before published. The photographs show up vividly the striking differences between the Far East Rand, Kimberley, the Van Ryn and the Nigel Reefs, and the Maps indicate the limits of the areas containing them.

The present values of shares on the basis of return of capital plus 10 per cent. interest per annum for the whole life of the mine (calculated on close estimates of its production in gold and profits) is worked out for each and every mine on the Far East Rand and the basis of the calculations is given for each.

A study of the values arrived at and of the gold and profits estimated will enable investors to judge on sound data what they are doing.

All interested in the mines of the Far East Rand should lose no time in ordering the book through their Booksellers. It may repay itself a thousandfold.

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£841,676; yield per ton, 1918 28s. 2d., 1919 29s. 6d.; total working costs, 1918 £608,617, 1919 £747,961; working costs per ton, 1918 22s. 7d., 1919 26s. 3d.; total profit, 1918 £151,879, 1919 £93,715; profit per ton, 1918 5s. 7d., 1919 3s. 3d.; development footage, 1918 11,279, 1919 15,798; ore reserve (tons), 1918 1,425,870, 1919 1,200,900; ore reserve (value), 1918 7·3 dwts., 1919 7·6 dwts. It will be noticed that the yield per ton has improved by 1s. 4d., but the costs have increased by no less than 3s. 8d. per ton, with disastrous effect on the year's profit. Amongst the factors that have contributed to this increase in the working costs, the following are the most important: Additional development is responsible for about 10½d. per ton. The direct expenditure on this work during the year amounted to £78,176, and the development suspense fund was increased by £7,295. These two items, aggregating £85,471, are £24,878 in excess of the corresponding figure for the previous year. On account of the very narrow reefs which prevail in this mine, an unusually large proportion of the rock broken carries insufficient value to warrant its being sent to the mill and is rejected. The quantity thus disposed of amounted to no less than 226,000 tons during the year. This results in a materially higher grade of ore than would otherwise be the case, but it is also an important factor in the high working costs per ton. A further important cause of the high working costs is the continued increase in the price of stores and of white labour. The footage of development was considerably greater than that of the previous year, especially latterly, when it averaged over 2,000 feet per month. Unfortunately, the results have not been satisfactory: in the lower part of the mine the Main Reef Leader shows only a moderate degree of payability, namely, about one-third, although the average of the footage accomplished during the year showed a higher percentage of payability. The South Reef is practically unpayable from end to end. The large area of payable Main Reef Leader in the neighbourhood of No. 3 shaft does not, in the bottom levels, show the same regularity of payable values that it did formerly, and the year's development has not led to the discovery of a payable zone of any importance. Up to the present the development carried out in the Bantjes lease area shows the ground to be much disturbed by faults, and indicates that about 50 per cent. of the portion explored will yield payable ore of average mine value. The ore reserves have been re-calculated as at the end of the year, with the following result: Main Reef Leader, 1,192,610 tons, value 7·6 dwts., stoping width 50 inches; South Reef, 8,290 tons, value 7·7 dwts., stoping width 49 inches; total, 1,200,900 tons, value 7·6 dwts., stoping width 50 inches. The programme for enabling the two mines to be worked as a more compact unit has made satisfactory progress, and a part of the additional equipment necessitated by the increasing depth of the workings has been installed. The use of Jack Hammers has been considerably extended during the year, and these machines have proved most useful in making up for the shortage of native labour for hand-drilling. More than a third of the total fathomage stoped is now being broken by this class of machine. The condition of the mine and the immediate outlook so far as grade of ore is concerned are good, and there will be little difficulty in maintaining the present rate of yield during the coming year, but the unsatisfactory values disclosed by the current development are giving some anxiety. This condition is being met by still further increasing the development programme. Additional burdens of various kinds continue to be placed upon the mines, and it does not appear that we have yet reached the high-water mark in this respect.

The Employment Question.

Notices or advertisements of appointments vacant on the mines or elsewhere, so long as the employment will be first offered to a returned soldier, will be published free of charge in the *S.A. Mining Journal*. In order to assist the mine secretaries to make known any vacancy for a returned soldier, a free copy will be sent weekly to every mine secretary who forwards his address to this office.

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ELECTRIFICATION OF S.A. RAILWAYS.

Leading Expert's Wide Scope of Enquiry—Details of his Successful Achievements.

Mr. Chas. Merz, Consulting Electrical Engineer, of England, whose report was issued last week upon the proposed electrification of certain sections of the South African Railways, will also report to the Government in regard to the generation of electrical power in South Africa generally. It is understood that Mr. Merz whilst in South Africa will take in hand other big municipal consultations. The firm of Merz & McLellan are consulting engineers to many of the principal railways throughout the world in connection with electrification schemes, with which work Mr. Charles Merz has been associated since its inception. Mr Merz was consulting engineer to the North-Eastern Railway for the electrification of the suburban lines upon Tyneside in 1903—almost the first electrified lines in the world. These lines are used mainly for passenger traffic, but recently electric working has been instituted on another section of the same railway used only for mineral traffic—that from Newport to Shildon. The latter is the only instance in Great Britain of the use of electric locomotive for working mineral traffic on a main line. The whole equipment was designed and carried out under the supervision of Mr. Merz's firm. The success of these sections already working electrically induced the directors to have a scheme prepared by Mr. Merz's firm for the equipment of the whole of the company's system, comprising 1,255 track miles. That has been done, and the proposals are now under consideration.

The firm have also designed and carried out important railway electrification schemes for the Victorian Government in Melbourne (Australia), involving some 300 miles of track, and at Buenos Aires on the lines of the Central Argentine Railway, involving in all the expenditure of many million sterling. The first two are now in actual operation. In 1913 Mr. Merz visited India at the request of the Indian Government and several of the big railway companies, in order to prepare schemes for the electric working of the lines in the neighbourhood of Bombay and Calcutta. These schemes have been temporarily held up by the war, but are now again under consideration. At the request of the Midland Railway Company and the South-Eastern and Chatham Railway Company in England, the firm have also prepared elaborate reports on the question of electrifying certain of these companies' lines. The work of the firm has had a marked influence on the development of electric traction, not only in England but abroad, both in principle and in details of design. They were, for instance, largely responsible for the introduction of the 1,500 volt direct current system which is now being adopted more than any other.

Mr. Merz and his firm have also been intimately associated with the development of electric traction on tramways and light railways, having been retained in connection with Cork Electric Tramways, Belfast City Tramways, Tyneside Tramways and Tramroads, Lanarkshire Tramways, Chatham and District Light Railways, Adelaide Corporation Tramways (South Australia), etc.

Electric Power Supply.

In 1889 Mr. Merz was appointed consulting engineer to the Walker & Wallsend Union Gas Company in connection with the earliest power scheme in Great Britain. When this undertaking was merged in the Newcastle-on-Tyne Electric Supply Company's undertaking he was appointed consulting engineer to this also. This undertaking alone has now a capital of nearly four mililon pounds sterling, and practically controls the County of Durham Electric Power Supply Company, the County of Durham Electric Power Distribution Company, Ltd., the Cleveland and Durham County Electric Power Company, Cleveland and Durham Electric Power, Ltd., the Northern Counties Electricity Supply Company, Ltd., and works in conjunction with the Waste Heat and Gas Electrical Generating Stations, Ltd., the Bankfoot Power Company, Ltd., the Tyneside Electrical Development Company, Ltd. The various concerns together form one inter-connected system, operated by the Newcastle company, having power stations aggregating 270,000 k.w. of plant and serving an area of 1,400 square miles, comprising some of the most important industrial areas in the country, *e.g.*, the shipbuilding yards and engineering works on the Rivers Tyne, Wear and Tees, the Northumberland and Durham coalfields, and the Cleveland (Yorkshire) iron fields. The whole of this undertaking has been developed under Mr. Merz's supervision and forms to-day the most important and successful scheme of its kind in the world. The connections to its system have steadily increased from year to year, and at present amount to 415,000 h.p. It supplies every kind of industry—railways, tramways, collieries, shipyards, engineering works, and factories of all kinds. Many interesting and unique features are connected with it—Mr. Merz was the first to develop the use of waste heat from coke ovens and blast furnaces for the purpose of generating electric power on the coalfields, so that power previously wasted is now fed into the main system, and is used for the supply to industrial consumers. He has also devoted much attention to questions relating to by-products in connection with electric power stations. His firm were the first to lay down a network of 20,000 volts underground cables in Great Britain, and have been closely connected with the development of modern high tension switch gear.

Mr. Merz and his firm have worked strenuously for the development of electricity supply in Greater London. Mr. Merz was consulting engineer to the promoters of the Administrative County of London and District Electric Power Bill, 1905, the first proposal to deal with the power requirements of Greater London in a comprehensive way, and he prepared and gave evidence for the scheme, which won the approval of Committees of both Houses of Parliament. In 1913 his firm was retained by the London County Council to report to them upon the present position and future development of electricity supply in Greater London, and Mr. Merz was subsequently a member of the Technical Commission appointed by the Council's Electricity Committee to draw up a detailed scheme on the lines suggested by his firm's report. During the war it was realised that a national development of electricity supply was an urgent necessity. Mr. Merz was appointed chairman of the Electric Power Sub-Committee of the Coal Conservation Committee, also a member of the Board of Trade Committee on Electric Power Supply, and of a number of other committees formed to consider electrical questions.

Power Stations.

In connection with the design of electric power stations, Mr. Merz has probably done more to influence the lay-out of modern stations than any other engineer. He and his firm have been responsible for the equipment of the North-East Coast Power Companies' stations, 270,000 k.w.; Chelsea Power Station (London Electric Railway Company), 70,000 k.w.; Melbourne (Victorian Government), 60,000 k.w.; Neasden Power Station (Metropolitan Railway Company, London), turbines, 25,000 k.w.; Fisk Street extensions, Chicago, 25,000 k.w.; Dock Sud Power Station, Buenos Ayres, 18,000 k.w.; San Fernando Power Station, Buenos Ayres, 12,000 k.w.; Perth (West Australian Government), 9,000 k.w.; and numerous other stations in Great Britain and abroad. Mr. Merz and his firm have been largely responsible for the development of steam turbines of the largest size for electric generating purposes, both in Great Britain and abroad. Mr. Merz is as familiar with the principal electrical developments in the U.S.A. and on the Continent of Europe as with those in England. His firm act as joint consulting engineers to the Commonwealth Edison Company of Chicago, whose undertaking is probably the largest single-city electrical undertaking in the world, supplying, as it does, the entire electrical needs of some two and a half million people, including railways, tramways, power and lighting.—*Cape Times*.

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COLLIERY NOTES AND NEWS.

S.A. Coal and London Opinion.

Commenting on our forthcoming Special Coal Number, the *Financial News* says: "On previous occasions we have drawn attention to the merits of certain South African colliery companies. As investments, though they do not pay spectacular dividends, they nevertheless yield good, steady results. Several companies are known to the London market. Dealings in the shares are at no time really active, because holders for investment prefer to sit tight. Hitherto they have done the right thing, and it is not at all improbable that in the future some of the leading companies will increase their rate of distribution. On this side the public does not seem to have grasped the importance of the coal industry in South Africa. Until the war taught its lessons, we believe that even locally the prospects were belittled, or ignored. For years past sporadic attempts have been made to form a combination of colliery companies in order to improve conditions. Difficulties always presented themselves, and nothing satisfactory was achieved. The best that has been done—and it has certainly worked well—has been the formation of the Coal Owners' Association, which pools outputs, and so eliminates some of the unsatisfactory features of unlimited competition. As elsewhere, South African coal varies in quality. Some of it is of the highest calorific value, and the measures seem illimitable. Steps are now to be taken to utilise this wealth to the best advantage. The *South African Mining and Engineering Journal* states that important developments are impending in connection with the extension of the by-product industry in Natal. The whole subject of the manufacture of sulphate of ammonia, tar, and benzol is being revived, and the erection of new plants, embodying the latest ideas in by-product practice, is under consideration. Our contemporary has hammered away at this subject for a very long time, and apparently is now within measurable distance of seeing its views realised. It is by no means abating its efforts, for it has appointed a special technical commissioner to visit all the important collieries in the Union, and intends to print his reports in a special supplement. Apart from the question of by-products, upon which opinions at the Cape are divided, South Africa has largely developed its export trade during the war, and this it means to keep. It is a direct menace to our own coal trade, for not only is the Eastern market to her hand, but the Union will make an endeavour to capture business with the Argentine and other South American republics, not to mention the possibility of shipping to this country."

The Coal Supplies of Southern Rhodesia.

A General Committee has been formed consisting of representatives of the Rhodesia Chamber of Mines and of the Rhodesia Resources Committee for the purpose of making a special investigation into the coal supplies and requirements of Southern Rhodesia. The Committee are of opinion that in view of the present restricted supply and increasing requirements, the opening up of at least one more colliery in the territory is an imperative necessity. Mr. C. B. Kingston has been appointed to conduct the investigations and make the necessary report on the question. The B. & M. & R. Railways have also joined the Committee.

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The Prime Minister on the Coal Industry: A Striking Tribute.

Speaking at Victoria West on Monday night, the Prime Minister, General Smuts, made another eloquent appeal to South Africa to make a fresh start. We have a great and glorious country here, he said, but we have a small white population. "Yet in this beautiful country we have some wonderful resources, the most wonderful and the greatest resources. South Africa is undoubtedly the greatest mining country in the world. You have more minerals here, you have a greater wealth of mines here than you will find anywhere else. Our coal is one of our greatest assets. But whoever thinks of that? The other day I had a conversation with a gentleman who came here in connection with a scheme for the electrification of our railways. Our railways can be run much cheaper by electricity than by steam, and the gentleman who has come out in connection with the matter is an expert with a world-wide fame. I discussed matters with him, and we talked about our South African coal, which made him remark that there was nothing in the world like our country. 'South Africa's potentialities as regards coal,' he said, 'are immense. You have one continuous coal field here and in Rhodesia which will not be exhausted for a thousand years.' In view of the fact that coal is one of the articles of which the human race has the greatest need, you can appreciate the possibilities and potentialities of a country like ours. We have enormous quantities here of the cheapest coal in the world. In olden days people only thought of the diamonds and gold which South Africa produces, but our diamonds and our gold must go as time passes, yet there are other resources which are far more valuable in the long run."

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Dr. Versfeld and Grahamstown Platinum.

To the Editor, *S.A. Mining and Engineering Journal.*

Sir,—In the article in your issue of September 20 by Dr. Wm. Versfeld in "Occurrences of Rare Metals in the Union," the following passage occurs: "The alleged discovery of large quantities of platinum near Grahamstown some years ago caused intense excitement for some time. The metal was, however, found to be of the phantom variety." It is quite true that the Union Government chemists failed to discover platinum in the Grahamstown minerals, and that one of these gentlemen actually suggested in the London *Chemical News* that the platinum was contained in the *borax* used for making the assays (as if borax manufacturers would be likely to adulterate their products with platinum!). If, however, the records of samples sent to Messrs. Johnson, Matthey & Co., of London, Messrs. Siemens & Halske, of Berlin, and Messrs. Heracus, three of the leading firms in Europe dealing with platinum and allied metals (Johnson, Matthey & Co. have been platinum refiners for almost a century), it will be found that these firms rarely reported a blank out of some hundreds of samples sent to them, and in one instance Messrs. Johnson, Matthey & Co. gave an assay of *nineteen ounces of platinum to the ton.* These firms do not deal in "phantom" metals. When in London some years ago I called on the last-named firm to learn their opinion at first hand, and their representative expressed no doubt as to the reality of the occurrence, and the interest his company took in the matter. Although little has been heard of "Grahamstown platinum" for some years, it is just possible that it may yet prove to be of commercial importance; there are still those who have faith in it, and I, for one, hope that their perseverance and hard work may be well rewarded; from the Government officials of their own country they have received little but snubs and contempt.—Yours, etc.,

E. G. BRYANT.

Box 5754, Johannesburg,
September 22, 1919.

The Drain of Gold.

A notice in last week's *Government Gazette* puts a stop to a practice which was seriously damaging the Union, and which, if not checked, would, according to one financial authority, have ruined the country. The notice in question deletes the words "other than the Province of Mozambique" from the section of the proclamation which was issued in 1917, and which, among other things, imposed restrictions on the export of gold coinage from Union ports. A person could only have £5 in gold in his possession. Delagoa, however, was specially exempted, and no limit was fixed, hence a traffic in sovereigns has sprung up owing to the high price of the sovereign at Delagoa, and the still higher price in India, where, according to the cables, a sovereign is worth 23s. 4d., and has, it is stated, locally gone as high as 26s. The exemption of Delagoa Bay has resulted in a lucrative traffic, and the draining of the Union of much gold.

PERSONAL.

The annual dinner of the S.A. Institute of Electrical Engineers will be held on October 25.

* * * *

Major J. R. Leisk, C.M.G., formerly Secretary for Finance for the Union, and lately of the South African Brigade in France, returned to the Union by the Balmoral Castle and has taken up his new duties as Director of the Central Mining and Investment Corporation.

* * * *

Sir David Harris, K.C.M.G., V.D., M.L.A., returned to Kimberley last week, after several months' absence in Europe. Sir David reached South Africa by the mail boat that arrived at Capetown on September 7, since when he had spent the intervening time in attendance at the Union Parliament.

Transvaal Gold Mining Estates, Ltd.

(Incorporated in the Transvaal.)

DECLARATION OF DIVIDEND No. 26.

A Dividend of 3¾ per cent. (9d. per share) has been declared by the Board for the period ending 30th September, 1919, payable to Shareholders registered in the books of the Company at the close of business on 30th September, 1919.

The Transfer Books will be closed from the 1st to 7th October, 1919, both days inclusive.

If possible the Dividend will be paid early in November, 1919, but owing to the irregularity in the mail service it is impossible to state the actual date of payment. The Warrants, however, will be despatched to Shareholders as soon as possible after receipt of the final Transfer Returns from the London Office. Those despatched from the London Office to persons resident in the United Kingdom will be subject to a deduction of English Income Tax.

Coupon No. 26 attached to Share Warrants will be payable at the London Office of the Company. Coupons must be deposited Four clear days before being paid, and unless accompanied by Inland Revenue Declarations, they will be subject to a deduction of English Income Tax.

By Order of the Board,
TRANSVAAL CONSOLIDATED LAND AND
EXPLORATION COMPANY, LTD.,
Secretaries,
per C. L. READ.

Head Office,
The Corner House,
Johannesburg,
24th September, 1919.

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SMELTING WORKS: WIDNES, ENGLAND. LONDON OFFICE: 11, LOMBARD STREET, S.E.
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Sensational Strike

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(S.A.), LIMITED,
2, SOUTHERN LIFE BUILDINGS,
JOHANNESBURG.

Native Papuans at a South Sea Island gold mine operating a No. 16 geared Oster Die-Stock

Tube Screwing Simplicity

UNTRAINED native labour successfully operating an Oster is certainly convincing proof of Oster simplicity of mechanism, ease of operation and accuracy of workmanship—qualities that have placed

For easier tube screwing
OSTER
Screwing Tackle
in all corners of the Globe.

The Oster Light Hand Tube Screwing Machine

geared with and without ratchet is admirably suited for mine needs. It is portable, easily operated and has a wide range of sizes and can be equipped with dies of any special pitch or number of screws to the inch.

The machine operates with a ratchet handle when screwing large tubes and with a crank handle for smaller sizes. Dies are opened or closed by a small handle. Dies are adjustable for over or under size. No separate pipe vise is required. The guides automatically centre the work.
Machines No. 16 screws 2½in. to 4in., No. 17 from 2½in. to 6in.

Write for complete catalogue of Oster Hand and Power Screwing Tackle.

BARTLE & CO., LTD.,——Agents for——THE OSTER MANUFACTURING CO.,
JOHANNESBURG. CLEVELAND, O., U.S.A.

Makers of a full line of Screwing Tackle, Hand, Belt and Motor Driven, for all sizes and uses.

THE WEEK IN THE SHAREMARKET.

A Setback on Profit Taking and Paris Selling—Improvement at the Close—Jewish Holidays Intervene.

At the time of closing for the Jewish holiday on Wednesday the market had begun to recover after a temporary setback. The setback occurred owing to profit-taking and some selling from Paris, due to unfavourable exchanges. All the Far East Rand stocks remain active, and Modder Easts continue in the van. Fluctuations there have been and Modder Easts were sold on Wednesday by profit-takers, but they finished in strong demand. Van Ryn Deeps are at last coming into their own, and rose appreciably in the last few days. All the Modder stocks and those of the "C.M.S." group are very firm and promise to be more active in the near future. Diamond and tin shares are a little quieter, but the market continues to show a broadening tendency and the whole outlook is improving. Fluctuations for the week to Wednesday are as follows:

	Fri. 19th.	Sat. 20th.	Mon. 22nd.	Tues. 23rd.	Wed. 24th.
African Farms	14 6†	14 3	14 3	—	13 9
Anglo-Amer. Corp	32 0†	31 3	31 0*	31 0	30 9
Apex Mines	7 6*	7 6*	7 7*	—	7 3*
Aurora Wests	8 9*	8 6*	8 6*	9 0†	7 6
Bantjes Consolidateds	3 1†	—	2 9*	2 10*	2 10*
Brakpan Mines	73 0	—	71 0*	74 0†	—
Breyten Collieries	—	—	7 0*	—	10 0†
Brick and Potteries	1 6*	—	4 6*	4 6*	1 6*
British South Africa	20 0*	20 0*	20 0*	20 0*	—
Bushveld Tins	2 6†	2 1	2 4	2 3	2 1*
Cassel Coals	—	—	37 0†	—	—
Cinderella Cons.	—	—	—	—	4 9*
City and Suburbans	7 0	7 0	7 0	7 0*	7 1*
City Deeps	57 6†	57 0†	55 0	55 0	55 0a
Clydesdale Collieries	27 6*	29 6*	28 6a	27 6*	29 0*
Con. Investments	—	32 6†	—	—	32 0†
Con. Langlaagtes	20 0*	20 0*	20 0*	20 0*	—
Con. Main Reefs	10 0	9 9	11 0	10 6	10 9
Con. Mines Selection	26 9	26 9	26 6*	26 0*	26 9
Coronation Freeholds	1 10*	2 0†	2 0†	1 11*	2 2
Coronation Freeholds	4 0*	4 0*	—	4 0*	4 0*
Crown Diamonds	9 7*	9 6*	9 9	9 9	9 9*
Crown Mines	50 0a	52 0	52 6	52 0*	53 6*
Crown Mines Debentures	£100*	£101*	£101*	£101	£101*
Daggafontein Mines	24 9	24 9	25 0	24 3	23 9
Do. Options (5 years)	7 0	7 0*	7 4½	7 4½	7 3
Durban Rood. Deeps	—	—	—	6 0*	6 6*
East Rand Coals	2 0*	2 8*	2 8*	2 9*	2 [illegible]
East Rand Deeps	1 1*	1 3	1 2*	1 0*	1 [illegible]
East Rand Minings	26 6†	26 0†	26 0†	23 0*	23 [illegible]
East Rand Props.	—	5 9	6 0	5 9*	6 1*
East Rand Debentures	£65*	£65*	£65*	£65*	£6[illegible]
Eastern Golds	1 6*	1 6*	—	1 6*	—
Frank Smith Diamonds	5 6*	5 6	5 8	5 6*	5 6*
Geduld Props.	53 0	53 0	53 0	53 0	53 6
Geldenhuis Deeps	—	—	8 0*	8 0*	—
Glencairns	—	—	1 0*	1 0*	—
Glencoe Collieries	6 0*	—	7 6	—	6 6*
Glynn's Lydenburgs	20 0†	20 0†	20 0†	—	20 [illegible]
Government Areas	92 3*	92 6*	92 6	92 9	93 0
Jhb. Bd of Executors	33 0*	33 0*	33 0*	33 0*	33 0*
Jupiters	4 0*	4 0*	4 0*	5 0†	4 0*
Klerksdorps Props.	1 8*	1 8*	1 9*	1 8*	1 8
Knight Centrals	5 10	5 11*	5 10*	5 10*	5 11
Knights Deeps	—	—	8 6†	—	8 6†
Lace Props.	21 3†	20 9	20 0*	20 0*	20 0*
Leeuwpoort Tins	30 6	30 0	30 6*	30 9	31 6
Lydenburg Farms	8 11	8 8*	8 9	8 6*	8 6
Meyer and Charltons	90 0*	—	93 0†	93 0†	—
Middelvlei Estates	2 5	2 4†	2 5†	2 3	—
Modder B.'s	172 6a	170 0	170 0	168 9	170 0
Modder Deeps (5s.)	45 0a	44 6*	45 0b	45 0*	46 1
Modder Easts	32 3	32 3	32 4½	31 3	30 0
Do. Options (3 years)	13 3	13 7½	13 3	12 6	12 3
Do. Options (4 years)	14 4½	14 3	14 1½	14 0	13 2
Hume Pipes	26 0†	23 0	22 6	22 0*	23 0
Natal Navigation Collieries	24 6*	—	25 6*	25 0*	—
National Banks	295 0b	300 0†	300 0b	300 0†	300 0†
New Boksburgs	1 7*	1 7*	1 7*	1 6*	—
New Eland Diamonds	29 0*	29 0*	29 0*	29 0*	29 0
New Era Cons.	11 6	11 6*	11 6	11 6*	11 4½
New Geduld Deeps	2 0*	2 3	2 3*	2 1*	2 4
New Heriots	9 0†	10 1½	10 0*	10 0*	9 0†
New Modders	£28½b	£27¼*	£27⅜	£28½	—
New State Mines	33 6a	32 3	31 0*	30 6a	31 0*
New Unifieds	3 6*	4 0†	4 0†	4 0†	3 6

	Fri. 19th.	Sat. 20th.	Mon. 22nd.	Tues. 23rd.	Wed. 24th.
Nigels	6 0*	6 6*	6 6*	7 0*	6 6*
Nourse Mines	12 0†	12 6†	12 0†	12 0†	11 6†
Premier Preferreds	152 6†	152 6†	—	152 6†	152 6†
Pretoria Cements	85 3*	86 0	85 3	84 0*	85 0
Princess Estates	2 1*	2 2*	2 4	2 3	2 3
Rand Nucleus	1 11	1 11†	1 10	1 11†	2 1
Rand Selection Corp.	80 0a	78 0*	—	76 6*	76 0*
Randfontein Deeps	6 3	6 2	6 0*	—	6 1
Randfontein Estates	23 0	23 3	23 0	22 6b	22 0
Roberts Victors	12 6	—	12 0*	12 6	12 9
Rooibergs	6 0*	6 0*	6 3*	6 0*	6 0*
Rose Deeps	10 0*	—	11 3*	—	—
Ryan Nigels	3 9*	4 0*	4 0*	4 0*	4 0*
Shebas	2 0†	2 0†	—	1 9*	2 1*
Simmer and Jacks	4 0*	—	4 0*	3 6*	4 0*
Simmer Deeps	2 0*	2 0*	2 6†	2 0*	2 0*
S.A. Lands	6 8	6 5*	6 3*	6 3*	6 3
Springs Mines	56 9	57 6*	57 3*	56 0	55 0
Sub-Nigels	22 6*	24 3	24 3	23 6	23 0
South Van Ryns	8 9*	8 10*	8 9*	8 9*	8 6*
S.A. Alkali	25 6	27 0	27 6	27 6	27 6
Swaziland Tins	26 0†	20 0†	20 0†	20 0†	20 0†
Transvaal G.M. Estates	15 3	15 6	16 0	15 9*	16 0
Tudors	0 10*	—	1 5†	—	1 0*
Tweefontein Colls.	25 0*	25 0*	25 0*	25 0*	25 0*
Van Ryn Deeps	78 0	78 0	80 0	80 0	79 0
Village Deeps	15 0†	15 0†	—	—	13 9*
Western Rand Estates	6 9*	6 6*	6 9	6 9†	6 0*
Witwatersrands	17 6	17 0*	17 0	—	—
Witwatersrand Deeps	10 0	10 0	9 6*	10 3*	10 0*
Wolhuters	3 3	3 3	3 3	3 3	3 4*
West Springs	26 9	27 6	27 7½	27 0	26 6
West Springs (Options)	10 0	10 3*	11 0	10 9	10 0*
Zaaiplaats Tins	7 9	7 8*	7 8	7 4*	7 2
Union 5 per cent.	£104½*	£104*	£104¼*	£104¼*	£104½*

*Buyers. †Sellers. aEx London. bOdd lots

The Engineers' Directory.

Excellent progress is being made with the preparation of the S.A. Engineer's, Electrical and Allied Trades' Directory, which is now in the press. To ensure the utmost accuracy and completeness a vast amount of work has been entailed, and the book in its final form will be a complete directory of the firms engaged in the engineering, electrical and allied trades, *plus* a list of the personnel of the mines, railways and municipalities throughout the Union and Rhodesia. Firms who have not yet returned the forms sent to them are earnestly requested to do so without delay. In some cases firms have sent in the lists of their specialities for the Buyer's Guide Section without signing them, and it would much simplify the work of compilation if firms conscious of having made this omission will communicate the fact to the Publishers, care of this journal.

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OSBORN'S
HAND AND HEART HOLLOW DRILL STEEL.
Write or 'Phone for Stock List.
SAMUEL OSBORN & Co., Ltd., SHEFFIELD and JOHANNESBURG.

CAPE ALLUVIAL DIAMONDS: AUGUST OUTPUT.

BARKLY WEST.

The following is the official statement of the output of diamonds from the public diggings in the Cape Province during the month of August, 1919:

Area.	No. of Diggers.	Weight Carats.	Value.		
Delport's Hope	25	180½	£3,748	5	0
Eland's Drift	1	10	821	10	0
Forlorn Hope	1	4½	45	0	0
Gong Gong	38	257	3,378	15	0
Good Hope	67	258½	1,182	13	0
Harrisdale	22	172	3,142	10	0
Hebron	77	345¾	5,658	10	0
Holpan	18	93½	1,363	10	0
Jonas Kop	3	13	219	0	0
Kareepan	60	363	5,990	7	6
Keiskama	2	5	28	0	0
Klipdam	65	352¼	6,553	5	6
Klipdrift	29	77	830	2	6
Last Hope	2	6	96	0	0
Longlands	28	127	2,091	15	0
Niekerk's Rush	5	23½	281	15	0
Rickett's Prospect	5	35½	229	0	0
Scholtz's Prospect	21	110¼	1,578	10	6
Snyder's Rush	8	27¼	355	0	0
Van Zoelen's Laagte	9	13¼	122	10	0
Waldeck's Plant	48	309½	1,788	15	0
Ward's Hope	7	45¼	767	0	6
Winter's Rush	23	411¾	15,112	10	0
	570	3,272	£61,384	3	0

N.B.—The number of claimholders in the Barkly West district during August, 1919, was 2,237.

HERBERT DISTRICT.

Area.	No. of Diggers.	Weight. Carats.	Value.		
Bxypaal	11	54¾	£1,163	15	0
Davidsdrift	2	19¼	477	0	0
Mosesberg	228	1,360¾	21,736	0	0
Schmidt's Drift	36	174	2,455	10	0
Sevonelles	1	2½	22	0	0
	281	1,611¼	£25,854	5	0

KIMBERLEY DISTRICT.

Area.	No. of Diggers.	Weight. Carats.	Value.		
Robinson's Kopje	4	28	346	0	0
Wedberg	7	35½	790	0	0
	11	63½	£1,136	0	0

TAUNGS DISTRICT.

Area.	No. of Diggers.	Weight. Carats.	Value.		
Home Rule	102	1,883	26,850	15	0
Killarney	5	28	295	10	0
	107	1,911	£17,146	5	0

PRIVATE ESTATES.

Area.	Weight. Carats.	Value.		
River View Diamond Syndicate	145¼	2,630	0	0
New Vaal River D. & E. Syndicate	745¾	15,476	5	0
Pniel Estate	228½	3,607	5	0

STANDARD BANK
OF
SOUTH AFRICA,
LTD.

SUBSCRIBED CAPITAL
£6,250,000

PAID-UP CAPITAL
£1,562,500

RESERVE FUND
£2,200,000

THE
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HEAD OFFICE, MONTREAL.

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Princes Street, E.C.
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68, William Street.
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14, Aleoutskala St.

Collections made. Drafts sold
Bills of Exchange purchased. Trade Enquiries effected.

510 BRANCHES IN CANADA AND NEWFOUNDLAND, ALSO
66 FOREIGN BRANCHES.

CUBA—Havana (5 Branches), Antilla, Banes, Bayamo, Caibarien, Camaguey, Cardenas, Ciego de Avila, Cienfuegos, Cueto, Florida, Guantanamo, Jatibonico, La Maya, Marzanillo, Matanzas, Moron, Nuevitas, Palma Soriano, Pinar del Rio, Puerto Padre, Sagua la Grande, Sancti Spiritus, Santa Clara and Santiago de Cuba.
PORTO RICO—San Juan, Mayaguez and Ponce. COSTA RICA—San José.
DOMINICAN REPUBLIC—S. Domingo, Puerto Plata, Sanchez, S. Pedro de Macoris and Santiago de los Caballeros.
MARTINIQUE—Fort de France.
GUADELOUPE—Pointe-à-Pitre and Basse Terre.
VENEZUELA—Caracas, Ciudad Bolivar, Maracaibo and Puerto Cabello.
BRITISH WEST INDIES.
Antigua—St. John's. Bahamas—Nassau.
Barbados—Bridgetown and Speightstown. Dominica—Roseau.
Grenada—St. George's. Jamaica—Kingston. Montserrat—Plymouth.
Nevis—Charlestown. St. Kitts—Basseterre. Tobago—Scarborough.
Trinidad—Port of Spain and San Fernando.
BRITISH GUIANA—Georgetown, New Amsterdam & Rose Hall (Corentyne).
BRITISH HONDURAS—Belize.

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Correspondents in Canada and West Indies for the NATIONAL BANK OF SOUTH AFRICA.

Capital Paid up and Reserves $31,000,000
Total Assets - - - - $430,000,000

TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Optimistic Feeling Resulting from Lower Grade Mines Commission Report—Premier's Speech much Welcomed—Timber and Building Materials—Bricks, Lime and Cement—Oils, Colours and Glass—Iron and Steel—Electrical Goods—The Great Strikes and Exchange.

A MORE optimistic tone prevails since the publication of the interim report of the Low-Grade Mines' Commission. The opinion is that it is a very genuine, reasonable report, and the recommendations are pretty much as expected. The exceptional feature is that it is a unanimous document, and seeing the Government Mining Engineer is the chairman, he must naturally endorse the findings of the Commission. This is considered a good augury that the Government will adopt the recommendations. Another big feature is the price of gold being from 15 per cent. to 16 per cent. above the Bank of England's maximum price, which alone will very materially assist the low-grade mines and also enable the producers to pay the increased phthisis tax. In addition to this report the speeches of the Premier, General Smuts, are very encouraging, as they are directed against our small population of whites being divided into so many groups. The Chamber of Mines Report was fair enough, but not too optimistic on account of the imposts to which the whole of the gold mining industry is now subjected. A disturbing factor is the big strike of steel workers in America. However, this is toned down a lot by subsequent cables, as the original ones stated that 600,000 steel workmen were on strike. This colossal number now appears to be considerably reduced, and no doubt it will resolve itself into a lightning strike. Inquiries were made at a large American indenting house, and the manager said that his representatives in New York had not cabled him on the subject, and evidently Johannesburg importers were not unduly alarmed as a couple of orders came in on Wednesday afternoon for steel goods from America. Another American representative states that these strikes have been going on for months, but we in Johannesburg only hear of them through private cables. However, it would appear that this extra colossal strike was cabled to the public press simply because it was so colossal. We need not be unduly concerned about these unfortunate gigantic upheavals in the labour world, as we have ample supplies of mining materials in South Africa for twelve months to come, and with the great attraction of our ready-money gold market, the world will see that we are not lacking material.

TIMBER AND BUILDING MATERIALS.

Deals are very scarce indeed. During Wednesday a broker wished to purchase 100 deals 9in. by 3in. for a mining firm, but could not do so owing to their scarcity in Johannesburg. It does not mean that there were no deals available, but the timber yards could not spare such a number as their contracts with the builders did not allow even such a small quantity to be taken from their very much depleted stocks. If the broker in question could have obtained these deals he would not have minded paying 1s. 9d. or even 1s. 10d. a foot, the ordinary quotation to contractors being 1s. 7d. to 1s. 8d. per foot; floorings, 8½d. to 8¾d.; ceilings, 6¼d. to 6½d. Relief is expected during the coming week, as ships are on their way to the Cape and are expected there within a few days. The Capetown timber yards are asking 1s. 4½d. for deals, which represents 1s. 7¾d. landed in Johannesburg. The cable news from the Baltic is anything but good owing to the labour troubles there, and as the southern ports of the Baltic will close in October the quotations are likely to go higher. Galvanised roofing iron continues very scarce and the price is 1s. 4½d. to 1s. 5½d., according to the length and moreover as to whether the buyers are in very urgent need of the iron to cover in waiting roofs. A few parcels keep arriving from the coast and several shipments are on the way from Great Britain. If this were not so naturally the prices would be much higher, as the demand is very great indeed in view of the expected rains.

SECOND-HAND TIMBER AND IRON.

Business is practically stagnant in the second-hand timber and iron yards, owing to the almost total absence of stocks. Dealers in general have been advised of the dispatch of materials ordered, but so far these have not materialised, although they are expected at any time. Nominal prices of timber, new, 1s. 8d. to 1s. 9d.; second-hand practically unobtainable, but where oddments can be snapped up the price is roughly 1s. 2d. to 1s. 3d. Iron is 1s. 4d. to 1s. 5d. for new; second-hand, 1s. 2d. The demand continues very firm and indeed much bigger than the supply.

BRICKS, LIME AND CEMENT.

The demand for bricks is still greater than the local kilns can supply, but a little relief is being found from several brick yards situated along the Reef. Lime is about normal, but cement is practically unobtainable. The building trade in Johannesburg still continues exceptionally brisk, for the various optimistic reasons already referred to and trade is increasingly active. The prices are higher, which is not preventing tenders being called for, but undoubtedly in a few cases the figures often prevent actual business. For example, a tender was called for a three-roomed house, which was expected to be near £900, but it turned out to be £1,075, and the would-be builder on those figures turned the proposition down, at any rate for a time.

OILS, COLOURS AND GLASS

All the ingredients for paint have considerably increased in price, and there is a strong opinion amongst paint dealers that paint will further advance on account of these upward prices. Linseed oil (Indian), raw, 110s. to 115s. a case, and boiled 120s. a case. Turps are quoted from New York at 102s. 8d. for two 4's, c.i.f. African ports, and as similar quantities are sold here at 100s. this is about 20s.

MINING INSTITUTE.
Certificates for Managers, Overseers, Surveyors.

RESULTS.—42 Managers' Certificates out of 55 in S.A., and 36 Overseers' Certificates in a recent 12 months; 11 Managers' Certificates (1 conditional) to date (1919) and we secured the only Overseers' Certificates in two recent examinations.

Greatly reduced fees. Survey Class just started. Overseers' Class may be joined at any time. Reef Classes where desired.
Hundreds of successes.

Address: Professor JOHN YATES, St. James' Mansions, Eloff St.

a case below what the latest quotations indicate for the replacement from America, according to New York prices. White lead, English, 75s.; American and Canadian, 65s.; best American salad oil, 145s. to 150s.; South American, 125s., and South African, 97s. 6d. to 100s. Castor oil (medicinal), 110s.; mining, ditto, 95s. 6d. to 97s. 6d., and mineral 45s.; medicinal liquid paraffin, 20s. a gallon, British and 15s. American. Grease, local, £30 to £32 and imported £45 a ton. Business is exceptionally brisk, as painting of roofs and walls is going on apace. The glass trade also is brisk, but doubts are entertained as to future supplies from Britain.

IRON AND STEEL.

The iron and steel merchants have firmed up their prices, out very slightly at present, in anticipation of the American workers in the steel mills. In addition to this there is a better feeling in consequence of the increased demand from the mines, which are buying a little more freely. There is no quotable change in prices. A second-hand dealer is selling small round imported iron, ½in., ⅜in., 5/16in. at 32s 6d. new. There was an auction sale of galvanised piping, which realised good prices; also there was a sale of new galvanised roofing iron, unbranded, fetching 1s. 2d. a foot, which was considered quite satisfactory, seeing it was unbranded and not at all clean, as evidently it had been hung up somewhere through financial or other reasons. Brass rods are 5s. 9d., imported mild steel 45s., and plates 41s. 6d. per 100 lbs.; drill steel, 7½d. a lb.

ELECTRICAL GOODS.

A leading indent merchant informs us that business has been pretty bad during the past month on the Exchange, with, however, one or two fairly bright days—Tuesday in particular, in comparison with others, was a good day—but, on the whole, buying has been very poor indeed. Prices remain about the same as last reported. It is said that several Japanese manufacturers have notified their agents here of big increases in electrical goods, especially in the form of wiring and cables, which are currently stated will amount to about 17 per cent. Another merchant said that he had been informed from Europe and from America that prices will certainly go higher, and he is of the opinion that this tendency of increasing prices will continue for some considerable time. Nor is it to be wondered at if, in view of the continued labour unrest in Great Britain and America, the tendency should be towards higher levels. As a matter of fact, seeing the unsettled state of affairs in the old world and the consequent increasing difficulties in obtaining raw materials, no improvement is looked for for some considerable time. Materials are coming in fairly freely, and the demand continues good for both town and country business.

THE GREAT STRIKES AND EXCHANGE.

No trade writer can ignore the great strikes in Britain and America. The position is so acute because of the world-wide labour unrest. The laying down of tools not only curtails production, but interferes with the exchanges throughout the universe. To illustrate this in a concrete manner, the exchange against London during the war period was always adverse between there and Norway and Sweden, even more so than now as between London and New York, and that is bad enough. In normal times Britain sent almost sufficient coal to Norway and Sweden to balance the return cargoes of Baltic timber. Say, for example, the account for coals came to a million pounds in a given period and the timber bill came to a million pounds, the accounts as arranged in the clearing houses of the banks would cut level and no money would pass. But the export of coal had to be stopped through the war exigencies, therefore the per contra account with Norway and Sweden had to be arranged and the timber paid for in some other way, viz., in gold, which had to be sent in bullion. Another example, nearer home, is the Johannesburg daily clearing house for the banks. The various banks send a representative to the local clearing house and practically cheques are passed for the differences, but a small amount of gold compared with the aggregate amounts of the total made up in cheques and other negotiable documents, must be passed to clear the final total, and sometimes a very small sum suffices to balance the ledgers. It happens that South Africa is a credit country, as our gold, diamonds, coal and base metals, as well as the products of the soil in the aggregate exported, come to very much more than we buy from oversea. Therefore the balance must come our way, a proof of which is that there is an abundance of money in this country and we are in the happy position of having had a full gold currency throughout the war period and onward, whereas in the European countries, according to the returned soldiers, it was all paper money, as they seldom saw gold coins. The question has been raised as to whether South African gold cannot be sent direct to America and so keep our exchange at par. Remember we are only just out of the wood as regards selling our own gold through London's free market, bringing us for the time being 15 per cent. more than the standard rate paid by the Bank of England. No doubt when we get our own mint and, what is more, our own refineries, bullion will be hall-marked from South Africa and passed current as such according to its actual weight in all parts of the world. Then, and even perhaps before, South Africa will pay its way direct and not through London, thus saving the adverse exchanges against us, because we are a Dominion now and are therefore free to do as we like, and unhampered trading, whether in gold or merchandise, is one of the essentials of a country's very existence.

COMMERCIAL EXCHANGE.

Quite a lot of miners' boots are negotiated through the Exchange. The price has advanced about 20 per cent. during the past six weeks, as it is difficult to get the heavier leather and the imported grindery. Business generally is fair but not bright, and there is a lot of new material, recently arrived, that is still being sold at prices just below the landed cost. There has been a good demand for large irrigation valves, which is some relief to the second-hand dealers who have large supplies. In this connection the agriculturists are buying steam boilers, especially of the loco. type. At an auction sale of woodworking machinery a broker remarked that he never saw such prices realised for second-hand machinery. Representatives from the Natal coalfields have been here during the week picking up boilers, pumps and spares and oddments of all kinds.

JOHANNESBURG CONSOLIDATED INVESTMENT CO., LTD.

(INCORPORATED IN THE TRANSVAAL.)

NOTICE OF GENERAL MEETING OF SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Ordinary General Meeting of Shareholders in the above-named Company will be held in the Board Room of the Johannesburg Consolidated Investment Company, Limited, Consolidated Building, Fox Street, Johannesburg, on Tuesday, the 25th November, 1919, at 11 o'clock in the forenoon, for the purposes following:—

To receive and consider the Statement of Accounts and Balance Sheet for the period ending the 30th June, 1919, and the Report of the Directors and Auditors thereon.

To elect four Directors in place of those retiring, in terms of the Company's Articles of Association.

To elect Auditors, and to fix their remuneration for the past financial year, and to transact any other ordinary business of the Company.

By Order of the Board,

W. H. MARDALL,
Secretary.

Johannesburg,
24th September, 1919.

Company Meetings.

TRANSVAAL G.M. ESTATES.

The annual meeting of shareholders of the Transvaal Gold Mining Estates, Ltd., was held at 3 p.m. on September 24th, in the Board-room, Corner House.

The chairman, Mr. H. C. Boyd, in moving the adoption of the report and accounts, said:—The report before you for the twelve months ended 31st March last sets forth in detail the reasons for the poor profit results for the year. Apart from the lower grade of ore available for milling and increased cost of labour and material, which in any event would have reduced the profit, the operations of the latter half of the financial year were hopelessly disorganised by the influenza epidemic, which virtually brought all work to a standstill for several months and involved serious loss for the period. There was, unfortunately, considerable mortality among all classes of employes. The native labour supply, which was far from being satisfactory at the outbreak of the epidemic, has remained inadequate ever since, and is to-day restricting the carrying out of necessary prospecting and development work. There has lately been a mild recurrence of influenza in the district, and we are fully 500 natives short of our requirements.

The tonnage milled decreased by over 38,000 tons, the revenue by 4s. 9d. per ton, and costs increased about 3s. 8d. per ton, the net profit for the year being only £15,551. This, with the unappropriated balance brought forward from the previous year, was dealt with as detailed in the report, a dividend of 2½ per cent. being paid for the first half of the financial year, but none for the second. The debenture debt was reduced to £18,940, and provision has since continued for further redemption at the rate of £1,250 per month: at the 30th instant the net figure will, therefore, be £11,500. The items of capital expenditure, totalling £8,721, are fully set forth in the general manager's report, the chief disbursement being on the Ponieskrantz North tramline, which is working most satisfactorily.

Prospecting and Development.

It is hoped that shareholders have been helped in following the details in the general manager's report for the past year's work by the plan attached thereto. Prospecting and development proceeded to the greatest extent permitted by circumstances. Generally speaking, results were unsatisfactory, no discovery of real moment being made. Some encouragement was met on the Portuguese reef in the Kameels Creek area, and here and there is in the Central Section small additional ore bodies were opened up. Ponieskrantz North continued to develop satisfactorily on the whole, and it is reasonable to believe that that mine will eventually yield a relatively large amount of payable if low-grade ore. Owing to discouraging values, work on Grootfontein was abandoned and the property let on tribute. In view of the poor results, work was stopped on the alluvial deposits in the neighbourhood of Pilgrims Rest and on Finsbury and Nooitgedacht, and the mynpachten on these two farms were given up. As previously indicated would be the case, the exploratory work to the dip of Duke's Hill and Peach Tree, which was persisted with so long, was terminated, the reef being persistently unpayable. Development at the Central Mines exposed ore of lower grade, and the reserves at the close of the year only averaged 8.25 dwt. as against just under 9 dwt. at the close of the previous year. It is satisfactory, however, that the tonnage was maintained, being about 408,800 tons. At Elandsdrift, in spite of further water troubles, the reserves were only some 3,000 tons down at 70,700 tons, and the grade improved from 14.8 to 15.2 dwt., while at Vaalhoek the reserve increased by some 16,000 tons to about 51,000 tons, the average value improving from 8.1 to 8.7 dwt. This increased tonnage is mainly due to recovery of the previously submerged area. Development on the Glynn's Reef was giving satisfactory results at the close of the year, and continues to do so. Additional claims have been pegged, and there is a very appreciable area which may contain payable reef.

Lack of Native Labour.

The importance of prospecting was emphasised at the recent meeting of shareholders in London. It appears almost unnecessary to say that prospecting and development have for years past been carried out to the greatest extent permitted by the available native labour force. It may safely be said that that is the only factor which has in the past limited and will in the future limit our work in this direction The management is fully alive to the vital necessity of such work, which is well organised and receives unremitting attention from the general manager, for the future of the company entirely depends on our being able to make fresh discoveries of value. During the current year prospecting has continued as vigorously as possible, but the whole of the company's operations, as has already been indicated, are being hampered by lack of native labour. Unfortunately, conditions are such on our property that native employes can safely leave us without any notice whatever, the consequence being that it is impossible to say what number of natives will be at work at any particular place on a given day. The drawback of this need not be emphasised; and we have lately availed ourselves to the fullest extent of an opportunity which was granted to us of submitting our views to the authorities. Regulations could be put in force whereby the natives could engage themselves, if only as monthly servants, and it appears to us that it should be a simple matter to ensure the carrying out of their obligations.

Ore Reserves.

Taken as a whole, the ore reserve position is to-day being maintained, and while minor discoveries continue to be made throughout the Central Mines there is scope for much exploratory work on the Glynn's Reef at Vaalhoek and elsewhere.

There is no change in the reserve position at the Elandsdrift Mine, but it continues to be hampered by lack of electric power. The scheme for the erection of a hydro-electric station on the the Nels River, referred to at the last general meeting, had to be abandoned as we could not come to terms with the owner of the proposed site An arrangement has now been come to with Glynn's Lydenburg, Ltd., for the supply of about 100 horse power, and the line from that property is being erected. The capital cost involved is about £7,500, this amount taking the place of the larger sum previously mentioned. It is feared that this additional power will not prove adequate for our ultimate requirements, but it was the best that could be done under the circumstances.

The reveune from the wattle plantaiton last year increased to nearly £1,700. The first of the blocks of trees which are to be felled in seven years cycles has just been dealt with, and we look for considerable expansion in the turnover when shipping conditions are more normal.

No attempt has been made to develop further the cattle ranching experiment, as we are forced to the conclusion that our land is not suitable for breeding purposes. The small herd we possess will, however, be maintained at least for the present.

During the five months ended August last the working profits have shewn a steady if modest improvement, being £21,624 for the period The cash position has been further improved, mainly by the reduction of the amount of stores carried, to the extent of some £16,000, and now that there is a free market for our gold we can expect additional revenue. Provision must be made for the quota of debenture redemption and taxation for the half year and for the total of £6,200 remaining to be spent on capital account. The Board has, just declared a dividend of 3¾ per cent. for the half year.

During the war, a very large percentage of our employes were on active service, and some ten have still to return to us. We call attention, with deep regret to the further casualties sustained.

The Board records its appreciation of the services rendered by the Consulting Engineer, General Manager and Staff generally. I now beg to move that the Directors' Report, Balance Sheet and Accounts for the year ended 31st March, 1919, be received and adopted.

Mr Gow seconded and the report and accounts were adopted.

The meeting confirmed the appointment of Mr. Max Honnet as a director in place of Sir Evelyn Wallers, resigned, and Messrs M. Honnet and M. T. Brown, retiring directors were re-elected.

Messrs Howard Pim and Hardy and Chas Stuart were reappointed auditors, and voted 200 guineas each for the past audit.

NEW BOKSBURG GOLD MINES.

At the annual meeting of the New Boksburg Gold Mines, Ltd., on September 24th, the chairman, Colonel Dalrymple, said:—The total expenditure during the year amounted to £3,328, of which claim licences paid to the Government absorbed £2,451. An amount of £2,033 was received in respect of interest, rents and sundry revenue, leaving a net expenditure of £1,295. Advantage was taken of the high prices ruling, and certain machinery and plant was sold, realising £4,623. The available cash at 30th June, 1919, was £34,078. The company retired from the Kleinfontein Group Central Administration, and sold its share in the assets of the administration for £4,217 0s. 9d.; this being the price fixed by an independent valuator. This amount was due to be received in February, 1920.

Since the close of the year the company retired from the Kleinfontein Power Association, and sold its interest for £20,000. The price was fixed by an arbitrator in terms of the deed of constitution of the Kleinfontein Power Association. The terms of payment were at present the subject of negotiations.

The report of the directors for the year and the statement of accounts were unanimously adopted.

ANGLO-FRENCH LAND.

Addressing the shareholders of the Anglo-French Land Company on September 24th, the chairman, Colonel Dalrymple, said that the revenue for the period was £1,247, and exceeded the expenditure by £463. The surface rights of five farms in the Waterberg district were disposed of, and realised £6,209. In each of the above cases the mineral rights were retained by the company. The available cash at the close of the year, after allowing for sundry creditors, was £19,442. Inquiries for farms had been more numerous than in previous years, and the increased demand for land was being maintained, particularly in the Northern Transvaal area, where ground is being bought mainly for cattle ranching. The company now owned 32 farms of a total area of 62,528 morgen, 289 square roods. No discoveries of minerals or precious stones in the neighbourhood of any of the company's holdings had come to notice during the year.

The report of the directors and the statement of accounts were unanimously adopted.

KLEINFONTEIN ESTATES.

Presiding at the annual meeting of the Kleinfontein Estates and Township, Ltd., on September 24th. Colonel Dalrymple said:—The net profit earned during the period was £26,800, including the profit realised by the sale of sundry assets. The item "share premium account" £2,689, appearing in the last balance sheet, has been transferred to the appropriation account. The sum of these transactions, added to the amount of £3,403 brought forward from last year, gives a total of £32,901, which was dealt with as follows:—Dividends, £19,656; Government taxation, £2,054—leaving a balance carried forward of £11,191.

During the year 95 stands in Benoni Township and 10 farm plots of a total area of 32 morgen 554 square roods were sold. The company has now been granted title for Benoni Further Extension, comprising 28 agricultural and industrial lots to the west and north of the township, the majority of which have been sold.

Certain ground adjoining the Middle Dam, in extent 17 morgen 463 square roods, is being donated to the Benoni Municipality. This ground is to be used for the purposes of a public park, and, in order that full advantage may be taken of this gift, the boating rights on the dam have been leased to the Municipality free of charge. It has been decided to cut up an area of 365 morgen on the western portion of the farm into agricultural holdings, ranging in size from 8 to 60 morgen. Application will shortly be made, as required by law, to the Minister of Lands to sanction this scheme. It is felt that there is a need for these small agricultural holdings in the vicinity of the town. The total contents of the dams, as at 31st August, 1919, was 621,000,000 gallons, as compared with 852,000,000 gallons at the same time in 1918. Special resolutions were passed and confirmed by shareholders on the 9th May and 2nd June, 1919, reducing the share capital from £100,00 to £63,750 by cancelling the 15,000 reserve shares and refunding capital at the rate of 5s. per share in respect of the 85,000 issued shares, thereby reducing the nominal value of such shares to 15s. each.

The report of the directors and accounts were adopted, and the retiring directors were re-elected.

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Notes and News.

Armistice Syndicate to Start Drilling.

The Armistice Syndicate, Ltd., has let a contract for diamond drilling on their claims on Doornkop No. 46 (the old Steyn Estate Company's Mynpacht). It is expected that drilling will start in about a fortnight.

* * * *

The South-West to be Thrown Open.

A wire received from our Special Correspondent in South-West Africa on Wednesday states that the Inspector of Mines at Windhuk, who has just returned from Capetown, says that the country will be thrown open on January 1 next under the old German law, with certain amendments. In the meantime no prospecting will be allowed.

* * * *

The New Name of Westinghouse.

It was understood a few weeks ago that the British Westinghouse Electric and Manufacturing Co., Ltd., was to alter its name to the Vickers Electrical Co., Ltd. The *Times* states that an amendment was carried at the meeting adopting the title, The Metropolitan Vickers Electrical Co., Ltd. A motion confirming this change had to come before a meeting called for August 23.

* * * *

Dullstroom Coal Mine Company.

At Machadodorp recently a meeting of shareholders in the Dullstroom Coal Mine Company, which has fairly large land holdings, was held, Mr. Schurink, M.L.A., presiding. It was resolved to work for a local Board, as the present Board is in Holland, and this is held to retard the progress of the company's operations. Some of the shareholders voiced the opinion that the mine was kept short of coal trucks "because it was not in a coal trust." This fact, it was contended, prevented the mine from accepting large contracts. It was pointed out that the mine had a long life, even at a greatly increased production, and that the seams were almost on the surface.

* * * *

Coal Dust and Miners' Phthisis.

In a lecture delivered last week, Dr. Cluver, Professor of Physiology, referred to the experimental work done by Dr. Haldane and Dr. Mavrogordato at Oxford to find if there are not antidotes to the disastrous silica. Coal dust, so far from being harmful, had been found to be positively beneficial. It caused slight catarrh and mucous, and among other things it brought up silica, which would otherwise accumulate in the cells of the lung and cause the death of those cells and make it easy for the tubercle bacilli to attack the weakened tissue. The experiments suggested that to dust silica mines with coal dust or some other substances which stimulated the expulsion of silica from the lungs would free us largely from miners' phthisis. He went on to say that Dr. Mavrogordato was shortly coming to Johannesburg.

* * * *

The Change-Over at Armstrong, Whitworth's.

Messrs. Sir W. G. Armstrong, Whitworth & Co., Ltd., have issued through their central commercial department, 8, Great George Street, Westminster, S.W. 1, a fine brochure of between 50 and 60 pages, describing the company's war-work in the production of battleships, guns and gun carriages, naval gun mountings, ammunition, cartridge cases, fuses, shipbuilding, aviation, aeroplanes, airships, etc. A brief concluding chapter alludes to the extensive scheme of reconstruction and re-arrangement of the works at Elswick, Scotswood, and Openshaw, for the supply of commercial products on a large scale, including turbine and internal combustion engines, engineers' tools, and machine tools. The engine works department has been amalgamated with the firm of A. & J. Main & Co., Ltd., as Armstrong, Main & Co., Ltd., and the motor-car department with Siddeley-Deasy & Co., Ltd., as the Armstrong, Siddeley Co., Ltd.

Pulverized Coal for Blast Furnaces.

We have received a copy of a paper recently presented to the Canadian Mining Institute, on the subject of the "Application of Pulverized Coal in Blast Furnaces," by Messrs. W. L. Wotherspoon and Mathewson, Mr. Mathewson is a director and consulting metallurgist of the American Smelting and Refining Company, which is the biggest company of its kind in America, being controlled by the Guggenheims. Mr. Wotherspoon was for many years in Johannesburg as assistant consulting mechanical engineer to the Central Mining and Investment Corporation, and left that corporation six years ago, after his work in connection with the design and construction of the Modder B. was completed. Since then he has been in the U.S.A. and in Canada, identified principally with the International Nickel Company and its associates. The subject of the paper is of general interest to South Africa in connection with its copper deposits, for by this new process it is possible to substitute comparatively cheap pulverized coal for a considerable portion of the very expensive coke which is normally used for fuel. The copper interests in Katanga are already very much interested in the process and the authors have had communication from their consulting engineers on the subject.

* * * *

The Electric Locomotive.

The percentage of electrified route mileage on United States main line railroads is about ten times that on the combined railroads of all other countries. Considering only lines handling electrically both freight and passenger service, W. B. Potter and S. T. Rodd, of the General Electric Company, find in the United States approximately 675 electric locomotives operating over 4,875 miles of track, and in the rest of the world about 450 locomotives operating over 1,000 miles of route, or 1,750 miles of track. A striking difference in development is noted. In America the success of heavy high-speed motor cars has led to similar equipment for locomotives; but Continental designers, with little experience in heavy motor-car equipment, have been sceptical of gearing and of motors on the axle, and have substituted the electric motor for the steam locomotive cylinder, retaining the side-rods and adding a few more. The Continental locomotives show many variations by the side-rod drive. Comparing only important trunk-line electrifications, the 210 locomotives of nine European railroads represent 28 different types, while the 364 locomotives of 14 American railroads represent but nine. The great argument for general electrification is the estimate that in 1914 American railroads consumed 140,000,000 tons of coal for service that electrically equipped roads could have rendered with 40,000,000 tons.

* * * *

The Proposed Rhodesian Amalgamation.

According to cabled advices, Sir Abe Bailey has arranged to amalgamate the Giant Mines, Enterprise Gold Mines, and the London and Rhodesian Mining and Land Companies, belonging to what has been known in the past as the Weil group. The proposition is said to involve the formation of a new company with a capital of £2,000,000, in 8,000,000 5s. shares, and the acquisition of the assets of the three companies mentioned by an exchange of share for share in the case of the Enterprise and of two shares in the new company for each share of the other two companies. This will involve the issue of 1,524,180 shares, nominal value £381,045, of the new company and leave £1,618,955 of nominal capital in reserve. The Giant Mines has an issued capital of £262,090, in £1 shares which are now quoted at about 8s. Heavy subsidence of ground caused the management to conclude that the property could no longer be operated with profit, and operations were accordingly closed down in May, 1917. The Enterprise, which has an issued capital of £200,000, has paid no dividend for the past eight years and its £1 shares are quoted at 5s. 6d.; while the London and Rhodesian Mining and Land Company, which has acted as a finance and shareholding company for the group, has never paid a dividend in its history of ten years. Its issued capital is £400,000, in £1 shares, which are now priced at 8s. Between them the companies hold a fair proportion of the capital of the Cam and Motor gold mines and own numerous tested and untested mining claims in Rhodesia, besides about 295,000 acres of land.

* * * *

The Fixation of Atmospheric Nitrogen.

In the House of Commons on April 5th, 1918, Mr. Winston Churchill announced that the Ministry of Munitions was about to embark upon the fixation of nitrogen from the air on a large scale. The Nitrogen Products Committee was set up shortly after Mr. Lloyd George became Minister of Munitions. In 1917 an interim report of the Committee recommended that manufacture on a large scale should be started, and early in 1918 beginnings were made with the factory, and arrangements made for the supply of electrical power. But progress was slow, and when the Armistice was signed the whole scheme was still in the embryo stage, and no nitrates had been produced. It is reported that a million of money was sunk, but the work was stopped. It is understood that one reason for the delay in the publication of the report of the Nitrogen Products Committee is the amount of work that has been necessary in the preparation of an index. This is believed to be now nearly complete. The issue of the report is awaiting a definite instruction from the Minister of Munitions. A representative of *The Times* was informed last week that the report, which is dated May last, deals at length with the project for installing plant in Great Britain for the fixation of nitrogen from the atmosphere, and that it views as feasible the Haber, or synthetic ammonia, process. The utilisation of water power for the purpose does not take a prominent place in the recommendations. The report is a final and not an interim one, but it is believed that it contemplates the resumption of investigations into both catalytic fixation and the use of nitrogen products in industry generally.

* * * *

Mr. Merz and Capetown Municipality.

Regarding the appointment of a consulting electrical engineer to Capetown Municipality, the Electricity Committee has reported as follows: "Your committee have taken advantage of the presence in this country of Mr. Charles H. Merz, of the firm of Merz & McLellan, consulting electrical engineers, who are at present engaged in preparing reports for the Government in connection with proposed electrification of railways, to interview this gentleman for the purpose of discussing the present position and possible future requirements of the City's electrical undertaking. Mr. Merz afforded the committee an interview on Friday morning, September 12, and as the result has undertaken to advise the Council generally in connection with the development of the electricity undertaking for a fee of £600 per annum, plus their usual charges for time spent by members of their staff upon any work which may be referred to them for report and advice. It is further understood that upon the return of Mr. Merz to England a general report upon the undertaking will be drawn up setting forth recommendations as to future developments, the cost of this report being covered by the first year's retaining fee. All travelling expenses in connection with any inspection or testing of plant, together with any expenses incurred in printing or cablegrams to be refunded at cost. The arrangement to commence as from October 1, 1919, and to be terminable after the first year by three months' notice on either side, settlements to be made half-yearly. It is further understood that the foregoing arrangement does not apply to any new power station or other large works which they may be asked to undertake and in connection with which extensive detail plans and specifications are required."

TOPICS OF THE WEEK.

EFFICIENCY AND THE LABOUR MOVEMENT.

The recklessly precipitate strike of the British railwaymen and the similar struggle going on in the American steel industry have brought labour questions to the forefront during the week. The national conference of employers and employed, called by the Union Government, will shortly take place, and it is regrettable that Mr. Crawford, who stands for so much that is sane and moderate in local labour circles, should at this juncture have been chosen to represent the South African Federation at the world labour congress in the United States. Indeed it may be said that in Messrs. Warington Smyth, Gemmil and Crawford, the State, the employers and the employed of South Africa are extraordinarily well represented at the conference in America. Meanwhile, despite the plight of the low-grade mines and the fantastically generous new phthisis compensation voted by the Union Parliament, it is said that the local unions are formulating further demands for presentation to the mines. As a fact, the real problem of the moment is how the mines are to obtain a fair return in efficiency for the concessions and increases of pay lavished upon the men during the war period. As the Chairman of the Simmer & Jack put it at the meeting last week: "We must not lose sight of the permanent effect of the concessions which have been made to European employees in the matter of wages and shorter hours. Up to the present these concessions have not been rewarded by any proportionate improvement in the output per man. As conditions return to normal and with the reinforcement of our mine staff by our old employees now back from service, we will be in a better position to pay special attention to this very important point." The Low-Grade Mines Commission, in its interim report, devotes considerable attention to this point, and it is noteworthy that a suggestion put forward by the labour witnesses is recommended in its entirety by the Government and Chamber of Mines representatives. That suggestion, put briefly, was, it will be remembered, the system of "shop stewards committees." With regard to co-operation between employers and employees, there is no doubt, says the report, as to the value of such from the standpoints of efficiency, improved relationship, elimination of unnecessary stoppage of work, and the creation of a feeling of better contentment all round. The advantages of improved relationship appear to have been recognised by the mining companies quite early in the war period, and evidence submitted both by mine managements and trade union representatives bear excellent testimony to benefits mutually derived. Trade unions and federations have been encouraged to meet the employers and discuss points of difference in matters relating to working conditions with very beneficial results. Works committees now exist on the majority of the mines of the Witwatersrand, and are composed of "stewards," representing the various shops, shafts, trades or unions, as is considered best. These "works committees" or "shop stewards committees" as they are more often called, are recognised by the unions and the South African Industrial Federation, the latter body being the executive head of the movement. The works committees provide at hand the most representative and effective machinery through which the employees of the particular concern can act. It is the one form of organisation which groups workers together at the point of production where they have a direct and common interest. For this reason a sense of responsibility on the part of the employees can be more easily cultivated, for without it the value of co-operation is greatly diminished. Works committees consist of employees only, and co-operation would be effected by means of joint committees consisting of works committees or their representatives on the one side, and the representatives of the management on the other. Such joint committees would operate along the lines contained in the suggestions of the British Ministry of Labour, modified if necessary, to suit local conditions. In view of the unanimity of opinion on the matter as indicated in evidence from the employees and their unions on the one hand, and mine managements and officials on the other, the Commissioners believe that their strong recommendation in favour of the immediate application of the scheme of works committees and joint committees will be readily adopted. It is obviously necessary that for the successful working of the scheme the members of the works and joint committees as well as the managements and employees as a whole must take a lively interest in the questions dealt with and in the prosperity of the mines. It will be observed that the function of these committees is a purely advisory one, and the decision and executive authority will remain with the management, which must have the final responsibility for the successful working of the mine. Since all parties seem agreed on the merits of the scheme it only remains to extend it to all the mines, and to enlarge its scope to cover all questions of efficiency. Thus, possibly, it may prove the much-sought solvent of our labour troubles.

Irrigation Schemes in South Africa: Warning.

The attention of the Oversea Settlement Committee has been drawn to certain alluring advertisements of irrigation schemes in South Africa that have recently appeared in the Press, in some cases in the form of articles, holding out prospects of an ideal career and large profits in return for a small capital investment. After consultation with the Office of the High Commissioner for the Union of South Africa they think it desirable to issue the following statement: "Intending purchasers of holdings on any property in South Africa which is dependent upon irrigation should carefully read the official Memorandum by F. E. Kanthack, C.M.G., Director of Irrigation for the Union of South Africa, entitled 'Irrigation and Land Settlement in the Union of South Africa,' copies of which may be obtained free of cost on application either to the Offices of the High Commissioner for the Union of South Africa, Victoria Street, S.W., or to the Oversea Settlement Office, 59, Victoria Street, S.W." The committee, on behalf of the Home Government and on behalf of the Government of the Union of South Africa, most strongly recommend persons not to buy such land in South Africa unless it has been personally inspected by themselves or by someone in whom they have complete confidence.

* * * *

Great Aircraft Competition.

The British Air Ministry makes the following announcement: A committee of members of the Air Ministry and of the aviation industry has been sitting for the past two months under the chairmanship of the Under-Secretary of State for Air to consider the question of encouraging the future development of aviation on the lines of increased safety. A large number of witnesses has been called, including constructors and designers and representatives of the public who are interested in aviation. It has been decided, as stated in Parliament, to institute a competition open to the British Empire. Prizes to the value of £64,000 will be awarded by the Government under the conditions which are set out below. (a) The aim of these competitions is to obtain a real advance in the efficiency and design of aeroplanes and seaplanes, more especially with the view of increasing the safety of air travel. The rules drawn up are intended to secure this object. (b) As regards the rules for aeroplanes, it is recognised that the conditions are, generally speaking, easier for the small machine than for the large. The object in this is to attract a large number of competitors from among designers of small machines. (c) The present competitions are not directly aimed at engine reliability nor at economy in fuel and oil consumption, although these are of the first importance, but chiefly at the attainment of efficiency in the machine itself. A much longer time is required to produce radical improvements in engines than in machines, and since it is intended that the present competitions should be held early next year, it has been decided to concentrate attention on the machine on this occasion.

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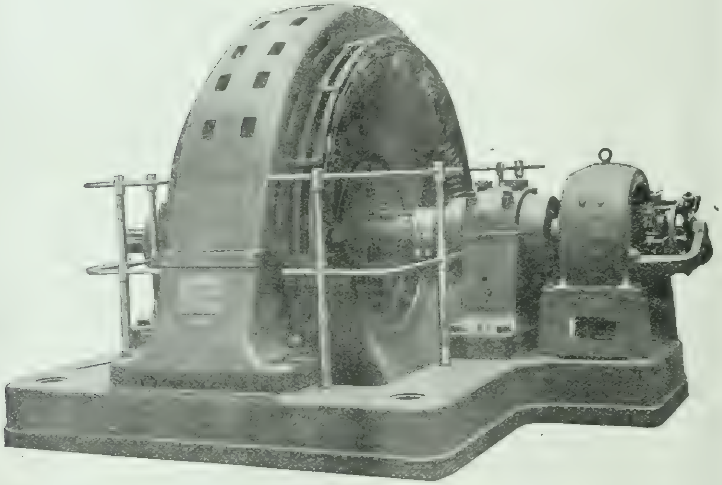

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IMPROVED OUTLOOK FOR THE JOHANNESBURG CONSOLIDATED.

Excellent Progress of Far East Rand Subsidiaries—Diamond Interests—Strong Financial Position.

The Johannesburg Consolidated Investment Co., Ltd., has had another excellent year. After providing for depreciation, English and Colonial income tax and other charges, the profit for the year amounts to £320,463 15s. 9d. This sum, together with £161,795 12s. 5d. brought forward, makes the total available balance £482,259 8s. 2d. The improvement in the company's profits is to a considerable extent attributable to the increasing returns which this company is obtaining from its large interest in the Government Gold Mining Areas (Modderfontein) Consolidated, Ltd., which during the long period of development was entirely unremunerative. On the 24th June the directors declared a dividend of 7½ per cent. free of income tax, as against 5 per cent. declared last year. This distribution absorbs £296,250, leaving £186,009 8s. 2d. to be carried forward to next account. The company has not only maintained, but materially increased, its liquid assets in British Government and other securities, and is in a position to acquire new interests as opportunity offers.

MINING INTERESTS.

Special reference is made in the annual report to the following companies:—

Government Gold Mining Areas (Modderfontein) Consolidated, Ltd.—The ore reserves show a very gratifying increase, and now stand at about 10,000,000 tons, the value of which is estimated to be 8 dwts. over 78 inches, and, given the necessary amount of labour, it would be comparatively easy to still further largely increase the company's ore reserves. The crushing plant has been increased by the addition of 5 tube mills. The profit on the tonnage milled during 1918 shows an improvement (as compared with 1917) of 2·754 shillings per ton. The results which are being obtained fully come up to the high expectations which were entertained of this property and its continued prosperity is assured.

Van Ryn Deep, Ltd.—The ore reserves of this company stand at about 2,500,000 tons of an estimated value of 9 dwts. over 70 inches. The additions to the reduction plant, referred to in the directors' previous report, have now been completed, but the supply of labour has unfortunately not been sufficient to enable the mine to employ its full crushing capacity. The prospects of this mine continue to be excellent, and a further improvement in profit may be looked forward to.

Randfontein Central Gold Mining Company, Ltd.—The effects of the floods referred to in the directors' previous report were only overcome towards the end of the year. Labour troubles and a severe influenza epidemic also contributed to retard the improvement in the company's returns, to which special effort is being directed. Good progress is being made in respect to the two new vertical shafts which were commenced in 1917, and which, when completed, will tend towards the more satisfactory working and development of the property and will also materially help in overcoming the present water difficulties.

New State Areas, Ltd.—The important interest acquired by the company in the New State Areas was referred to in the directors' previous report. Judging by the highly satisfactory results obtained by the mines on the ground adjacent to that of the New State Areas, it is confidently anticipated that the company's interest will prove a highly remunerative asset. It may be mentioned that satisfactory progress is being made with the sinking of shafts and the surface equipment of the property.

MINING STORES WORKING COSTS.

Working costs are still very adversely affected by the abnormal price of all mining requirements and by labour difficulties. The industry is also handicapped by the ever-increasing burden of taxation, which, if persisted in, must result in a reduction of the total amount of ore extracted from the Witwatersrand mines. The value of the gold produced by the company's group of mines for the year ended 30th June last approximates to £7,775,000.

DIAMOND MINES.

The profits earned by the leading diamond mining companies in South Africa (in which this company is largely interested) have never been so great as at the present time, owing to the increasing demand for diamonds at greatly enhanced prices. The policy of control of output and marketing inaugurated by the chairman in 1917 has been more than justified.

ESTATES AND TOWN PROPERTY.

There has been an active demand for houses and building sites during the past year, which has been encouraged by the steps taken by the company to develop and popularise its residential estates.

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THE FAR EAST RAND.

Its Reefs, Mines and Share Values.

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Member of Lord Milner's Gold Law Commission, Author of "The New South Africa," "The Witwatersrand System," and Joint Author with A. E. O'Flaherty of "£1,000,000,000 for Us or Germany?"

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Introduction by C. J. TUTT.

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The Book deals exhaustively with the reefs of the Far East Rand, their individual character, their stratigraphical position and extent, their economic importance, gold and profit values, and contains up-to-date information never before published. The photographs show up vividly the striking differences between the Far East Rand, Kimberley, the Van Ryn and the Nigel Reefs, and the Maps indicate the limits of the areas containing them.

The present values of shares on the basis of return of capital plus 10 per cent. interest per annum for the whole life of the mine (calculated on close estimates of its production in gold and profits) is worked out for each and every mine on the Far East Rand and the basis of the calculations is given for each.

A study of the values arrived at and of the gold and profits estimated will enable investors to judge on sound data what they are doing.

All interested in the mines of the Far East Rand should lose no time in ordering the book through their Booksellers. It may repay itself a thousandfold.

If any difficulty is found in obtaining the book, orders can be sent to the Author at 3 Transvaal Bank Buildings, Fox Street, Johannesburg, or to the offices of this Journal.

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THE YEAR WITH GLYNN'S LYDENBURG.

The net profit of Glynn's Lydenburg for the year amounted to £9,961 16s. 7d., to which must be added the sums of £30,427 6s. 7d. brought forward from the previous year, £1,048 16s. 3d. funds transferred, and £54 10s. unclaimed dividends written back in terms of Article 127, making a total of £41,492 9s. 5d. This has been dealt with as follows: Union and Provincial taxation, £2,383 2s. 10d.; dividends Nos. 35 and 36 of 2½ per cent. each, £8,500; balance carried forward, represented by cash and cash assets less liabilities, £30,609 6s. 7d.; total, £41,492 9s. 5d. The balance of £30,609 6s. 7d. is made up as follows: Shareholding in Rand Mutual Assurance Co., Ltd., £177 15s.; stores, live stock, vehicles, furniture and sundry debtors, £14,462 15s. 5d.; net cash after providing for all liabilities, £15,968 16s. 2d.; total £30,609 6s. 7d. The amount appropriated for taxation includes the sum of £746 5s., paid under the Provincial Gold Profits Tax Ordinance to the Province of the Transvaal. An action brought by the New Modderfontein G.M. Co., Ltd., to test the validity of this Ordinance was decided in favour of the Provincial Council of the Transvaal, and this decision was confirmed on appeal. Mine development suspence account is reduced to £6,458 1s. 4d., by writing down mine development account in respect of the reduced tonnage of ore reserves. Mynpacht No. 2 prospecting expenses account has now been merged into mine development. Mine stores have continued to increase in cost, and have restricted profits accordingly. The arrangements for the disposal of gold during the war period having come to an end, the necessary facilities for a free market in gold have now been obtained, and it is hoped that this will result, at any rate for a time, in an increased price being realised.

Consulting Engineer's Report.

Mr. E. H. Clifford, the consulting engineer, writes:—Hereunder is a statement showing the important features of the year's work, together with those of the previous year. Further details of the former will be found in the manager's report. Total tonnage milled, 1918 46,964, 1919 37,982; yield per ton, 1918 37s. 9·5d., 1919 37s. 0·3d.; working costs per ton, 1918 26s. 7·5d., 1919 33s. 4·1d.; profit per ton, 1918 11s. 2·0d., 1919 3s. 8·2d.; total working profit, 1918 £26,235, 1919 £6,988; sundry revenue, 1918 £3,605, 1919 £2,974; ore reserves, 1918 138,928 tons, 1919 108,546 tons; ore reserves, 1918 9·8 dwts., 1919 9·4 dwts. The year's results have been unsatisfactory in every respect. The tonnage has diminished considerably, and operating costs have increased by no less than 6s. 9d. per ton. This was primarily due to the influenza epidemic which invaded the mine in October, 1918, causing severe mortality amongst both whites and natives and an almost complete cessation of work. The mine has not yet recovered from the effects of the epidemic which is still prevalent in the district. Although the influenza was certainly responsible for the major portion of the increase in working costs, the extra cost of practically all materials and of white labour has contributed to this result. Considering the shortage of native labour, satisfactory progress was made both in reclaiming the Werf section and in development at Compound Hill. Unfortunately, the latter is not looking quite so promising as it did last year, but it is quite likely that the falling off in development values is only temporary. You will notice that the ore reserves are lower, partly because comparatively little development was done and partly because the increase in working costs has rendered certain blocks of ore unpayable. What with heavy rains at the beginning of 1918, which caused the almost complete effacement of the Werf mine, and the influenza epidemic, the company has had an undue share of ill-luck, and it appears that it will yet be some time before it completely recovers. The most important desideratum for bringing about this result is an improvement in the native labour supply.

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MODDER EAST DEVELOPMENT: INSPECTOR'S REPORT.

In his report for the quarter ended 30th June, 1919, on Modder East, the Inspector of Mining Leases writes:—Ore reserves: During the quarter the payable reserves were estimated as at 30th April, 1919, resulting as follows: Cloverfield shaft, 582,900 payable tons, value 8·4 dwts., percentage 96; No. 3 shaft, 22,100 payable tons, value 5·6 dwts., percentage 4; totals and averages, 605,000 payable tons, value 8·3 dwts., width 55·8 inches. The lowest value of any of the payable blocks is 4·9 dwts., which, after making the necessary allowances for sorting, residues, etc., would allow of a recovery of about 20·6d. per ton milled. Since this estimate was made the reserves have been re-estimated as at the 30th June, 1919, and the above total has been increased to 850,000 tons of an average value of 8 dwts. over a stoping width of 55 inches, but at the time of writing the details of this re-estimate have not come forward, and I can only deal with the estimate made as at the 30th April. The above reserves in the Cloverfield shaft section are situated in practically a compact block close to the boundary of the Geduld Proprietary Mines. There are other small areas of payable ore in various parts of the mine, but these are not included in the published reserves, as the information in connection with them is insufficient to arrive at their likely tonnage. The estimate of reserves may be considered as somewhat approximate, for the reason that some of the blocks which are of considerable area include a large percentage of ore of a grade below the probable pay limit, which by averaging with ore of a higher sampling value is brought up to or above that limit. Moreover, the length of the reef exposed on the perimeter of the blocks referred to does not average more than 55 per cent. of such perimeter, and this, combined with the large areas of the blocks, allows a considerable margin for error in estimation. Possibly it would have been safer had more low-grade ore been excluded and the value of the remainder increased.

No. 2 circular shaft (in the Government lease area): The footage sunk amounted to 172 feet, and the footage lined to 151 feet, the total depth of the shaft being 1,218 feet, of which 1,081 feet are lined. This shaft has now reached its full depth, and the necessary walling is completed, and a station has been cut at what will be known as the 11th level. In the course of station-cutting reef was disclosed for a distance of 60 feet, averaging 5 dwts. in value over a width of 34 inches. Compared with the previous quarter there was an increase in the total footage developed of 1,366 feet, and a total footage sampled of 1,210 feet, while the percentage of payability of the footage sampled increased from 50 to 53 per cent.

PERSONAL.

We much regret to record the death of Mr. J. B Overbeek, of the Union Corporation Engineering Staff, which took place last week.

* * * *

The list of certificates issued by the Mines Department for the fortnight ending 1st October, 1919, is as follows:—Mine Overseers (Metalliferous Mines): C. O'C. Ferrero, A. P. Mellet, G. Rothmann, W. C. Rule, C. J. Snijman.

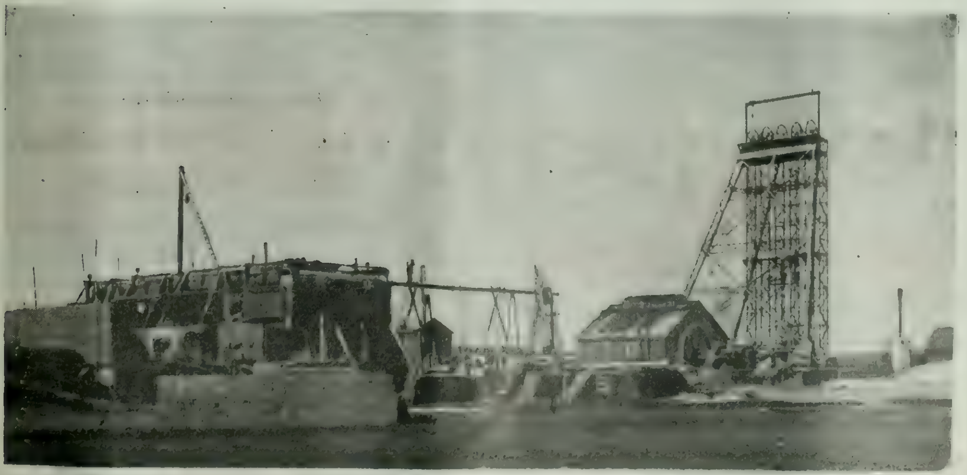
* * * *

Dr. R. B. Young, Professor of Geology, will deliver a lecture at the School of Mines on Wednesday, 8th instant, at 8.15 p.m. Subject: "The origin and subsequent history of the auriferous conglomerates of the Witwatersrand." The public are invited.

* * * *

In connection with the formation of the Imperial Mineral Resources Bureau and our own undeveloped minerals, Mr. T. G. Trevor, Inspector of Mines, Pretoria, under instructions from the Minister of Mines and Industries has left for England. Mr. Trevor will have an office with the High Commissioner for the Union of South Africa at 22 Victoria Street, Westminster, London. He will remain in England for at least two months, doing everything in his power to interest English manufacturers in the immense field of supply of base minerals which there is in the Union, and which was in danger before the war of being controlled by foreign capital.

GEDULD PROGRESS



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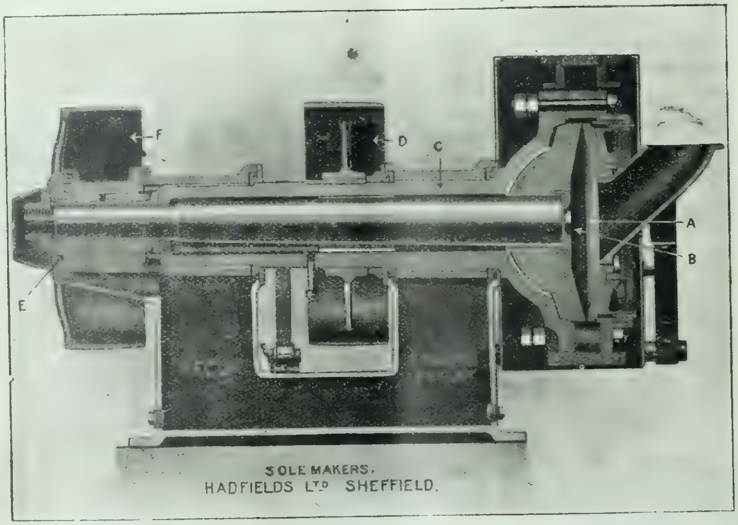

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THE EAST RAND GEOLOGICAL CONTROVERSY.

Dr. Mellor and Mr. Clifford Reply More Fully to Mr. Bleloch.

Arising out of the discussion between Mr. W. E. Bleloch and Dr. Mellor and Mr. Clifford at the recent E.R.P.M. meeting, interest attaches to the following reports on the geological question from the E.R.P.M. Company's consulting engineer, Mr. E. H. Clifford, and from its consulting geologist, Dr. E. T. Mellor. These are appended to the official report of the meeting recently circulated, and we reproduce them below. Mr. Clifford writes:—

Mr. E. H. Clifford on the Blue Sky Fallacy.

"As I have now had an opportunity of perusing Mr. Bleloch's remarks at the annual meeting, I beg to submit the following statement to supplement the reply that I made at that time. We are asked by Mr. Bleloch to believe that at some undefined position between the Blue Sky Mine and the Cason there is a large fault, or fault zone, which has been entirely overlooked. The fault he describes is not a small affair of a thousand feet or so, but a very large dislocation which throws the Main Reef series as far as Leeuwpoort several miles to the south-east. Notwithstanding the fact that the reef has been followed in many drives from one side of this alleged fault to the other, which shows no signs whatever of its presence, either underground or on the surface; notwithstanding the considered opinion of every qualified geologist in the country and of the engineers and underground staff of the East Rand Proprietary Mines, whose daily business it is to deal with such matters, Mr. Bleloch states that he thinks the Main Reef series is not to be found on your property eastwards of the Blue Sky. It is quite true that at a point between the Cason and the Blue Sky shaft certain changes occur in the character of the deposition of the reef, which changes are very well known, and possibly may have led Mr. Bleloch to postulate a large fault. This change in character, however, which has been studied by a great number of people, is susceptible to a single explanation which is supported by facts, and in this respect, therefore, differs materially from Mr. Bleloch's explanation. There is no reasonable doubt in my mind that the reef which has been opened up by the Blue Sky workings is identically the same reef that has been mined throughout the whole of the East Rand Proprietary Mines and the mines further west. However this may be, the result from a business point of view is the same, because, whereas Mr. Bleloch claims that the reef has no existence on this part of your property, we have, as you know, unfortunately had to come to the conclusion that it is not economically workable.

Heidelberg District's Unhappy History.

"Mr. Bleloch also condemns what we refer to as the Southern Area scheme on account of the depth, and finally he offers, as a solution to all the troubles of the East Rand Proprietary Mines, the suggestion that you should acquire new ground in other localities. These localities are in the neighbourhood of Leeuwpoort, some four miles to the south of your property, Troyeville, and Bezuidenhout Valley, about six miles to the west, and the neighbourhood of Heidelberg, some 22 miles away. The suggestion is, of course, a wide one, and one that cannot be discussed in its entirety here, but should it ever be given complete consideration, geological theories, whatever their nature, would play a subordinate part in the discussion. In any case, however, I should strongly advise the Board not to spend any money whatever in verifying Mr. Bleloch's theories in either of these districts, notwithstanding his confident belief that payable mines will be found therein. I note that he is of opinion that the great bulk of the ore in the Heidelberg district is payable. It may perhaps interest shareholders to know that this district has been well known to geologists and engineers since the earliest days of the Rand, that large sums of money have been spent in prospecting it, and that no successful venture has resulted therefrom. Further, practically the whole of the district has remained dormant and considerable areas have been open for anyone to peg until quite recently, when Mr. Bleloch and companies in which he is largely interested have pegged out most, if not all, of the available ground. To some extent Mr. Bleloch's own work has shown how unpromising such an undertaking would be. He informed me that he has been entrusted during a long period of years with large amounts of money by people who have confidence in his theory. The expenditure of this money has not yet resulted in a single successful mining venture.

"Mr. Bleloch refers to a certain reef situated on the property of the old Leeuwpoort Gold Mining Company, which he alleges to be the faulted part of the Main Reef series. I am well acquainted with this reef, and I am quite sure that it is not Main Reef series, but belongs to a much higher geological horizon. The reef has been prospected to some extent, and many years ago an attempt was made to work the ore by a small 10-stamp battery. No success has attended any of these efforts. Mr. Bleloch made certain references to the question of deep mining, from which I gather that he thinks it is impracticable to mine at a depth of 7,000 feet. I venture to think his statements in this connection are incorrect and his arguments unsound. Undoubtedly it would be more expensive to mine at a depth of 7,000 feet than at a shallower depth, but the question whether it is practicable or not depends entirely upon the value of the ore. I regret that Mr. Bleloch should have found it necessary to use such strong language in referring to the treatment he has received at the hands of the technical controllers of the industry. For myself, I can only say that on a former occasion I gave Mr. Bleloch's theory the most careful consideration, and found it necessary to tell him—I

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trust with due courtesy that I considered the theory fallacious.—(Signed) E. H. [illegible], Consulting Engineer."

Dr. Mellor writes:—

"With regard to Mr. Bleloch's statements at the recent meeting of the E.R.P.M., the following remarks, in addition to those made by me at that meeting, may be of interest to your shareholders as presenting other aspects of some of the points raised. Mr. Bleloch is apparently unacquainted with much of the work that has been done in the neighbourhood of the E.R.P.M., and speaks as if the theories he now puts forward were new, and as if nothing had been done to clear up uncertainties which may have been justified at an earlier period in the exploitation of these fields. He further refers to a blank wall of opposition to investigation. Those, however, who have had the time and opportunity to go fully into the matter know well that few areas on the Rand, or on any mining area in the world, have had so much attention given to them in the way of prospecting as the eastern end of the E.R.P.M. property and the country still further east. The results, of which Mr. Bleloch appears to be ignorant, have been most conclusive and convincing. Mr. Bleloch has obviously overlooked those results, or he would not put forward the 'extremely simple explanation' which he considers explains the poorness of the reef in the Blue Sky area. Mr. Bleloch appears to consider that the presence of a small fault and a dyke in the Blue Sky Mine affect the question of the continuity of the reef from the Cason to the Blue Sky. Anyone who examines the plan to which he appeals will be able to see at a glance that the change from payable to unpayable reef takes place along a line far removed from the fault referred to, and where it is perfectly obvious from the plan that there is no break whatever in the continuity of the reef, since it has been continuously opened up along many levels. Those acquainted with the mine workings know that the gradual change from good to poor reef is perfectly clear and easy to follow. It is also perfectly obvious from the plan that the fault there shown does not prevent anyone following the reef without interruption from the Cason to the Blue Sky along a large number of separate levels in the lower part of the mine.

'Far East Rand' Not New.

"With regard to the reefs which Mr. Bleloch states are outcropping in various places, such as Leeuwpoort, Troyeville and elsewhere, and which he appears to believe have never been tested, there is abundant evidence in existence to the contrary. The testing has been done not only by those trained engineers whom Mr. Bleloch regards with such evident antipathy, but also long ago by those shrewd and practical prospectors whom Mr. Bleloch rightly holds in estimation. Their verdict on many of these occurrences is also well known to most of us, and has not been lost sight of in estimating the possibilities of these reefs. Assertions such as those just referred to have been made over and over again, and as often put to the test, always with the same result. Large sums of money have already been spent both by the large companies and by smaller syndicates in attempts to verify the confident assertions which have been made by Mr. Bleloch and others. There would be little harm, however, in their repetition if they were not likely to give a very wrong impression to many people to whom the past history of the Rand is not so well known as it is to those whose special business it is to be acquainted with it. By anyone conversant with recent movements on the Far East Rand, and the area far to the south of it, to which the name 'Far East Rand' has recently been so loosely and so improperly extended, Mr. Bleloch's recommendation of the latter areas as a means of improving the position of the E.R.P.M. will hardly be regarded with favour. We shall all be glad to see any new district added to the productive goldfields of the country. It may, however, be well to remember that the area referred to is not new, but has been known and prospected for over 20 years by practical prospectors of the old type experienced in testing and tracing the reefs, which have made the Rand what it is. The extensive outcrops referred to were well known to these men, and have also at various times been the object of much attention from numerous mining engineers and geologists. The results so far obtained, whether by the earlier work or by recent additional exploration, do not appear to encourage the hope that speculation in such areas may prove the salvation of the E.R.P.M. Responsible mining engineers who are fully conversant with all that has been done will look for very different evidence to that at present forthcoming before classing the reefs of the Heidelberg area as gold producers with those of the Far East Rand proper.—(Signed) E. T. Mellor, Consulting Geologist."

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Cape Province Diggings.

The following is the official statement of the diamond output from the public diggings in the Cape Province for July month:—

BARKLY WEST.

	Carats.	Value.
Delport's Hope	105	£1,336 10 0
Elandsdrift	83¾	1,909 0 0
Forlorn Hope	2¾	33 0 0
Gong Gong	365¾	3,621 0 0
Good Hope	265¼	2,506 7 6
Harrisdale	119¼	2,398 15 0
Hebron	276⅜	4,183 15 0
Holpan	63½	663 15 0
Jonas Kop	6½	83 10 0
Kareepan	379¾	6,867 0 0
Keiskama	28¼	249 10 0
Klipdam	336½	5,439 0 0
Klipdrift	83	1,518 5 0
Last Hope	11¾	166 5 0
Longlands	172¼	2,429 15 0
Niekerk's Rush	17½	135 5 0
Rickett's Prospect	20¾	388 10 0
Scholtz's Pros.	100¼	984 17 6
Snyder's Rush	50¾	797 15 0
v. Zeelen's Laagte	15¾	166 5 0
Waldeck's Plant	574¾	10,389 8 6
Ward's Hope	22¾	282 0 0
Winter's Rush	655	12,073 0 0
	3,657½	£58,622 8 6

HERBERT.

	Carats.	Value.
Brypaal	30	515 0 0
Mosesberg	1,236¾	23,122 15 0
Platdrift	12½	260 0 0
Schmidt's Drift	169	2,440 2 6
Seyonelles	[illegible]	3 0 0
	1,44[illegible]	£26,340 17 6

KIMBERLEY.

	Carats.	Value.
[illegible] Kop	[illegible]	1,035 0 0
W[illegible]	[illegible]	706 10 0
	10[illegible]	£1,741 10 0

TAUNGS.

	Carats.	Value.
H[illegible]	1,877½	25,144 15 0
Killarney	15½	164 5 0
	[illegible]	£1,741 10 0

PRIVATE ESTATES.

R[illegible] Vaal Diamond Syndicate: 109 carats, value £1,691 10s.
New Vaal River Diamond & Estate Syndicate: 301 carats, value £8,873 10s.

Pniel Estate: 315½ carats, value £6,094 5s.

COLLIERY NOTES AND NEWS.

FORTUNES HIDDEN IN COAL.

Getting all the wealth there is in coal by low-temperature distillation has hovered for years like an elusive will-o'-the-wisp before the vision of innumerable engineers. Again and again success has been proclaimed for one system or another whereby coal could be profitably transformed into gas, oils, spirits, and a multitude of by-products, leaving as residue a fuel which would burn brightly and smokelessly in the open grate. The problem is, however, so far unsolved that the British Government have subsidised experimental research on a large scale, as part of their endeavour to promote coal conservation. In addition, several of the leaders of British industry have combined to tackle the problem in a thoroughly business-like way. After making a careful study of the various existing processes and the causes of failure or partial success, they decided upon the most promising line of progress and erected a plant large enough to settle the commercial as well as the engineering questions involved. At this plant over 2,000 tons of coal of different qualities have been treated with excellent results, and there is a fair prospect of securing the co-operation of large gas companies in applying the results under everyday conditions. So many factors are involved—such as the varying characteristics of coal, and the fluctuations in the market of by-products—that a fresh solution must be worked out for almost every district. Nevertheless, we are soon likely to see this British enterprise, in which many thousands of pounds have been sunk on the sporting chance of success, lead to gas companies offering the public smokeless fuel as well as gas, and acting as manufacturers of motor spirit and many other substances for which there is an urgent demand.

* * * *

THE COAL SHORTAGE IN EUROPE.[*]

It has usually been thought that with the coming of peace, despite the appalling destruction of French collieries, the difficulty of Europe supplying itself with coal would pass away. The destroyed mines of France produced 20 million metric tons (of 2,205 lbs.) in 1913; but even this enormous loss of coal producing capacity represented only 3 per cent. of the total production of Europe, which was, in 1913, 730 million metric tons, so it has a relatively small effect on European coal supplies as a whole; there are other greater factors in the deficiency of production. George S. Rice, Chief Mining Engineer of the Bureau of Mines, who has just returned from an extended mining investigation in France, Belgium, Great Britain, the Rhine Valley, and the Saar district, reports that the shortage of fuel that prevailed during the war continues, and that there is probability of a still more serious deficiency unless the United States can come to the rescue by an extensive programme of exporting. He finds that, although there was virtually no destruction of the Belgian coal mines, of which the Germans evidently expected to retain possession, the Silesian, Polish, and the Bohemian mining districts have been, and still are, affected by the military fighting and undoubtedly their coal production will suffer; but the most important effect on production in Europe is the general labour unrest and changes in labour conditions which have brought about serious lessening of coal production. The cost of production is from 75 to 150 per cent. greater than in 1913, due to increase in cost of labour and material. In most countries the wages of miners have more than doubled. But the most serious changes, because of its position as the big coal-exporting nation of the world, are those taking place in Great Britain, which in 1913 produced 287,000,000 long tons (2,240 lbs.) and exported 77,000,000 long tons. The output in the year beginning July 16, when the miners' working day was shortened, will be about 70 million tons less than in 1913. To summarize: the deficiencies in the several countries were before the war supplied by Great Britain, and Great Britain now faces a loss of its export business through reduction in its coal production. On a pre-war basis of consumption the following tabular statement gives the deficiency in the various countries in Western and Northern Europe which must be met by imports:

	Long tons (2,240 lbs.)
France	20,000,000
Spain	3,650,000
Italy	9,650,000
Holland (other than supplies from Germany)	2,010,000
Sweden	4,560,000
Portugal	1,360,000
Norway	2,300,000
Mediterranean countries (other than Italy)	3,500,000
Denmark	3,030,000
Total	50,060,000

In 1913 Great Britain supplied 31,000,000 tons to North Europe and 32,000,000 tons to France and South Europe, a total of 63,000,000 tons. If the statements made before the Parliamentary Commission are correct, Great Britain will be able to supply only 23,000,000 tons of coal for export during the year, dating from July 16. There is thus a total deficit of approximately 40,000,000 tons to be supplied by America or South Africa.

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[*] Abstracted from report by the U.S. Bureau of Mines.

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A REVIEW OF THE MINING INDUSTRY.—IV.

Points from the Report of the Secretary for Mines and Industries for 1918.

In the course of his annual report for 1918 the Secretary for Mines writes:—

Federated Chamber of Industries.—One of the most important events of the year from the industrial point of view was undoubtedly the first annual convention of the new Federated Chamber of Industries which was held at Johannesburg under the presidency of Brigadier-General Sir Charles Crewe. The convention was opened by the late Sir Meiring Beck, Minister of Posts and Telegraphs, on the 17th June. The first meeting of so many leading industrialists and producers from all parts of the Union will no doubt constitute a landmark in industrialism in South Africa.

Administration of the Industries Division.—While there was a great increase in the volume of work in dealing with inquiries, in investigating possible sources of supply of materials required by Union manufacturers, in having tests made of raw materials, in finding markets, and in the various other functions of the division, an endeavour was made, notwithstanding shortage of staff, to collate in form suitable for easy reference the large amount of valuable information which has been collected regarding production, sources of supply, commercial possibilities of raw materials obtainable or producible in the Union, and information concerning trade and commerce generally. Much remains to be done in this direction, but even though these collated records are not yet completed, they are proving invaluable in the work of the office. The services of the Imperial Institute, London, have been utilized frequently in having raw materials tested and reported on as to their commercial value, and valuable assistance has also been rendered by the High Commissioner and by the Trade Commissioner for the Union in connection with investigations and inquiries by the Industries Division and in the furtherance of Union trade. These services are very highly appreciated.

Journal of Industries.—The production of the *Journal of Industries* continues to prove a valuable means of disseminating information regarding the natural resources of the country, its manufactures, trade openings abroad, and other matters of industrial interest. Since December, 1917, when there were 900 subscribers to the *Journal*, the number of subscribers has risen to over 1,300. During the past three months the publication of the English edition has been run at a small profit. A number of the more important technical papers published by the *Journal* can be had as separate memoirs. During the year Mr. T. Sleith, M.B.E., was appointed to report on the trade conditions of British East Africa, Uganda and Zanzibar, and his report has been published as a memoir by the Department.

IV.—White Labour Department.

The work of the White Labour Department has made steady progress since the reorganization effected in 1917. An additional employment office was opened during the year at Port Elizabeth. There is increasing evidence of a desire on the part of both employers and workpeople to make use of the employment offices, and an increased number of persons were placed in employment notwithstanding the existence of the various organizations dealing with the question of the re-employment of returned soldiers. Much more use could, however, be made of the Government Labour Exchanges. If employers would use them more the men would do so.

Industrial Disputes.—The Department's services were enlisted in many cases of industrial disputes throughout the Union with good results. A noticeable feature during the year was the greater tendency in the Transvaal Province to make use of the Industrial Disputes Prevention Act of the Transvaal (No. 20 of 1909). Assistance was also rendered in the forming of joint boards of employers and employees in various industries with a view to establishing better relations between the interested parties. There were thirteen strikes during the year within the Witwatersrand area, nine of which were confined to Johannesburg. There was one lockout (the plasterers) affecting the whole of the Transvaal. Five minor strikes took place in the gold mining industry. The number of persons affected by twelve of the abovementioned strikes was 1,861, involving a loss of 17,789 days' work and an estimated loss of £21,142 in wages. Dislocation of industry on account of strike action by the workers was, as will be seen, on a comparatively small scale in the Union of South Africa in 1918 and was far less than in other countries. This result was due probably to two main factors—the desire of the majority of the trade unions and of the workers of the country generally not to complicate during war time, the industrial position already made difficult by the constantly increasing price of stores, etc., and secondly, the policy of negotiation which has been widely adopted by both workers and employers. In particular the Board of Reference in the gold mining industry, although its deliberations took up much valuable time, did a most useful work in preventing, shortening, and settling a large number of minor disputes which, without such a body, would have produced friction, dislocation, and hostility in the industry. To those responsible for the work of the Board great credit is due. The securing of mere industrial peace is, however, not the be-all and end-all of such bodies. Their importance lies in the real and growing measure of self-government and control in the affairs of the industry as they affect their daily life, which they give to the workers themselves. Many workers state that it is the sense of loss of control of the circumstances in which they daily live and work, and of the consequent sense of dependence which is the characteristic of modern industrialism, which are more felt by them to-day than anything else. Whatever helps them to regain a measure of control over their own lives and, at the same time, to appreciate the difficulties and the conditions of carrying on the industry in the development of which they are directly and vitally interested, is a step forward in the settlement of the all-important problem of the relationship of capital and labour. More than increase of wages, more than reduction of hours and opportunity for leisure, the worker is asking not for the management of complicated works involving processes and questions of world commerce with which he knows he is not competent to deal, but for the control of those conditions in the shops and in his daily life which affect him directly and insistently. This is largely the quest of the worker to-day, and it calls not for constant Government interference but for recognition on the part of the employer or the management, and for practical industrial statesmanship on the part of both the parties which are most directly interested in finding a solution. It involves co-operation and loyalty to one another, and if the employer meets the worker in this direction, he looks for a return in the shape of keenness and efficiency in work, and an end to slackness. Discipline must become greater not less in the mutual interest. Something tangible in this direction has been accomplished as far as it has gone by the Board of Reference in the gold mining industry, although among a certain percentage of men it appears that individual efficiency has not made that response which it is to be hoped and which it is believed will yet be forthcoming. In other industries, such as the building trades, the furniture trades, coachbuilding, shop assistants, printing, tailoring, and others, the same ideas are working. The number of disputes recorded is not an accurate criterion of the amount of unrest prevailing, or of the work of the Department. Wherever dissatisfaction is scented, wherever bad conditions are reported, it is the endeavour of the Department to step in and try to negotiate inquiry and settlement to remove mutual suspicion and misunderstanding, and to establish, as far as possible, permanent methods of voluntary co-operation by employer and worker for the settlement of their own troubles by themselves among themselves without outside arbitration, dictation, or other form of interference—in short, to prevent the causes of disputes and not to heal them.

(*To be continued.*)

THE WEEK IN THE SHAREMARKET.

Steady in Face of British Labour Crisis—Strike News Causes but Temporary Setback.

The market opened weak on Monday owing to the British railwaymen's strike and the threat of its extension to the Triple Alliance of Unions. As the week wore on, however, and it was seen that the British Government was making a good fight, quotations recovered, and by Thursday had regained most of what they had lost. Of course, it is impossible to say what may happen, and the position in England is fraught with much anxiety. The local market is in a very healthy condition and merely waiting on the news from the other side. Should the trouble be satisfactorily ended we may expect a considerable increase in sharemarket activity here. Fluctuations during the week were as follows:

	Fri., 26th.	Sat., 27th.	Mon., 29th.	Tues., 30th.	Wed., 1st.	Thurs., 2nd.
African Farms	14 6†	13 6*	13 9†	13 0	13 0*	13 3*
Anglo-Amer. Corp.	30 0*	31 6†	28 6*	28 6*	29 0*	28 6*
Apex Mines	7 6*	—	7 3*	—	—	7 6
Aurora Wests	—	—	9 0†	—	—	—
Bantjes Cons.	2 10*	2 10*	2 10*	3 0	2 10*	2 10*
Brakpan Mines	70 0*	70 0*	71 0	70 0*	69 0*	71 0†
Breyten Collieries	—	—	7 0*	8 0*	7 0*	—
Brick & Potteries	4 6*	—	—	4 6A	—	—
British South Africa	—	20 6*	—	—	—	—
Bushveld Tins	2 0*	2 2*	2 1*	2 2*	2 3	2 4
Cassel Coals	—	—	—	—	32 6*	—
Cinderella Cons.	—	—	—	—	—	4 6*
City & Suburbans	7 6	7 9	7 3*	7 3*	7 6	7 3*
City Deeps	55 6*	57 0*	58 0†	55 6*	56 0	55 0*
Clydesdale Collieries	27 6*	27 6*	27 6*	27 6*	27 6*	28 0*
Con. Langlaagtes	—	20 0*	21 0†	20 6*	20 9*	20 9*
Con. Main Reefs	10 9	10 9	10 6	10 6	10 6*	10 6*
Con. Mines Selection	26 6*	26 9*	26 6	26 0*	26 0*	26 0*
Coronation Freeholds	2 0*	2 2*	2 2	2 1	2 1*	2 3*
Coronation Syndicates	4 0*	4 0*	4 0*	—	—	—
Crown Diamonds	9 9	9 6	9 4	9 0	8 9*	9 3
Crown Mines	53 6*	53 6*	52 6*	52 6*	53 0*	—
Crown Mines Deb.	£101½*	£102*	£102*	£102*	£102*	£102*
Daggafontein Mines	24 0*	24 3*	23 6	23 6*	23 6*	23 6
Durban Rood. Deeps	—	7 3*	8 0*	8 0*	8 0*	8 0*
East Rand Coals	2 8*	2 11†	2 7*	2 10†	2 7*	2 7*
East Rand Deeps	1 2*	1 2*	1 1*	1 1*	1 0*	1 0*
E.R. Minings	24 0*	24 6*	23 6*	26 0†	—	26 0†
East Rand Props.	6 3	—	5 10	—	—	5 8*
East Rand Deb.	£65*	—	£65	£70†	£70†	£70†
Eastern Golds	1 6	—	—	1 3*	—	—
F. Smith Diamonds	5 7*	5 8	5 7	5 9	5 9*	5 11*
Geduld Props.	53 6	53 6*	53 0	52 0*	52 0*	52 3A
Geldenhuis Deep	8 0*	8 0*	8 0*	8 0*	—	—
Glencairns	—	1 0*	1 0*	1 0*	—	—
Glencoe Collieries	6 6*	7 6†	6 6*	6 0*	6 0*	6 0*
Glynn's Lydenburgs	20 0†	—	—	—	—	19 0†
Government Areas	93 6	93 6	92 6	92 0*	92 3	92 6
Jhb. Bd. of Exectrs.	33 0*	33 0*	33 0*	33 0*	33 0*	33 0*
Jupiters	3 9*	4 6†	4 0*	4 0*	—	4 3*
Klerksdorp Props.	1 8*	1 8*	1 8A	1 8*	1 8*	1 8*
Knight Centrals	5 11*	5 9*	5 9*	5 7*	5 7*	5 9*
Knights Deeps	8 0†	8 0	8 0†	—	8 0†	8 0†
Lace Props.	19 0*	19 0*	19 0	19 0*	—	19 0*
Leeuwpoort Tins	32 0	31 6*	30 6	30 9*	31 3*	31 3*
Luipaardsvlei Est.	—	—	3 0	3 3†	3 0†	3 0†
Lydenburg Farms	8 4*	—	8 3*	8 3	8 3*	8 3*
Meyer & Charltons	93 0†	93 0†	93 0†	—	90 0*	90 0*
Middelvlei Est.	2 3	2 3*	—	—	2 6†	2 4
Modder B.'s	170 0A	169 6*	167 6	165 0A	167 6*	167 6*
Modder Deep	46 9	47 0	45 0	45 3	46 6	46 9
Modder Easts	32 0	32 3	30 7½	31 3	32 0	33 4½
Do. Options (3 yrs.)	13 3	13 3	12 7¼	12 10	13 1	13 4½
Do. Options (4 yrs.)	14 4½	14 10½	14 3	14 9	14 6*	14 9*
General Mining	4 9*	—	—	—	—	—
Hume Pipes	24 6	23 6*	23 0*	24 3	23 0*	23 0*
Natal Navig. Col.	26 0*	—	25 0*	—	—	25 0*
National Banks	£15†		—	£15*	£15¼†	£15¼†
New Boksburgs	1 6*	1 7*	1 6*	—	1 7*	1 6*
New Eland Diam.	29 0†	29 0†	28 3*		28 3*	28 0*
New Era Cons.	11 3*	11 4*	11 3	11 3	11 3	11 3*
New Geduld Deeps	2 3*	2 3*	2 3	2 3	2 4†	2 2*
New Heriots	9 0†	—	—	—	—	—
New Kleinfonteins	10 6	11 0	10 6*	10 0*	10 3*	10 6*
New Modderfontein	£28½	£28¼*	£27⅞*	£28⅛A	£28½*	£28¼
New Unifieds	—	4 0†	3 0*	4 0†	—	—
Nigels	6 6*	7 0*	6 6*	7 0*	6 9*	7 0*
Nourse Mines	11 6*	12 9	13 6†	13 0†	12 6*	13 0
New State Areas	32 0	32 9	31 6	31 3	32 0A	31 9
Premier Preferreds	152 6†	152 6†	152 6†	152 6†	152 6†	152 6†
Pretoria Cements	86 6	87 9	85 0*	86 6†	—	85 6
Princess Estates	2 2*	2 4	2 2*	2 2*	2 2*	2 2*
Rand Collieries	3 6*	3 6*	3 6*	3 6*	3 6*	3 6*
Rand Nucleus	—	2 1*	2 3†	2 3†	2 3†	2 0†
Rand Select. Corp.	76 0*	76 6B	76 0	75 6*	76 3*	76 0*
Randfontein Deeps	6 6*	6 3*	6 1*	6 0	5 9*	6 0†
Randfontein Est.	22 0	22 0	21 3*	21 0	21 3	21 3
Roberts Victors	12 3*	12 0*	11 6A	12 9	12 0*	12 9
Rooibergs	6 6	6 6	6 3*	—	6 6†	6 0*
Ryan Nigels	4 0*	4 3*	4 1*	4 6*	5 0*	5 0*
Shebas	2 0*	2 3	2 6	2 3*	2 4*	2 4*
Simmer & Jacks	3 6	—	4 9*	4 6*	4 3*	4 0*
Simmer Deeps	2 6	2 6	2 0*	2 6	2 0*	2 6†
S.A. Breweries	—	—	—	—	37 0*	—
S.A. Lands	6 3*	6 6	6 3	6 3	6 4	6 4*
Springs Mines	56 0	55 6*	55 3	55 0	55 0	54 9
Sub Nigels	23 3*	24 0	23 9	23 0*	23 3*	23 3
S. Van Ryns	8 7*	9 0	8 6*	8 6*	8 6	8 6*
S.A. Alkali	30 0	30 0	30 0*	30 0*	30 0*	35 0
Swaziland Tins	20 0†	—	20 0†		20 0†	20 0†
Trans. G.M. Est.	16 0	15 6*	15 6*	15 9*	15 3*	16 0
Tudors	1 0*	0 10*	—	1 0*	1 1*	—
Tweefontein Col.	25 0*	—	—	—	25 0*	25 0*
Trans-Delagoa Invest.	—	80 0*	80 0*	80 0*	80 0*	80 0*
Union 5 per cent.	£104¼	£104*	£104¼*	£104½	£104½	£104½
Van Ryn Deeps	80 0	80 0	80 0	80 0	79 6	79 6
Van Dyks	—	4 0	4 6	4 3	3 0*	3 3
Village Deeps	—	15 0†	13 0	14 0†	13 6*	13 3*
Village Main Reefs	—	—	7 6*	7 6*	7 6*	7 6*
Western Rand Est.	6 6*	6 9†	6 9*	6 11	6 9	6 9
Witwatersrands	18 0†	—		—	—	—
Wit. Deeps	10 0*	10 9	10 6	10 6*	10 6*	10 6*
Wit. Townships	31 0†	31 0†	31 0†	31 0†	31 0†	31 0†
Wolhuters	3 3*	3 3*	3 3*	3 4*	3 6	3 4*
West Springs	26 10¼	27 0	26 4½	26 3	26 4½	26 3
Do. Options	10 10½	11 0	10 3	10 3	10 3	10 6
Zaaiplaats Tins	7 1	7 0A	7 3	7 3*	7 9	7 5*

*Buyers. †Sellers. AEx London. BOdd lots

The Engineers' Directory.

Excellent progress is being made with the preparation of the S.A. Engineer's, Electrical and Allied Trades' Directory, which is now in the press. To ensure the utmost accuracy and completeness a vast amount of work has been entailed, and the book in its final form will be a complete directory of the firms engaged in the engineering, electrical and allied trades, *plus* a list of the personnel of the mines, railways and municipalities throughout the Union and Rhodesia. Firms who have not yet returned the forms sent to them are earnestly requested to do so without delay. In some cases firms have sent in the lists of their specialities for the Buyer's Guide Section without signing them, and it would much simplify the work of compilation if firms conscious of having made this omission will communicate the fact to the Publishers, care of this journal.

'Phone 4673. Box 3162.

OSBORN'S

SPRING STEEL.

Write or 'Phone for Stock List.

SAMUEL OSBORN & Co., Ltd., SHEFFIELD and JOHANNESBURG.

New Patents.

Thomas Edgar Richards.—Improvements relating to structures.

The Aero and General Pump Manufacturing Co., Ltd.—Improvements in or relating to pumps.

The Holt Manufacturing Co.—Track adapters.

Oscar Kermoye and Charles Claran.—Improvements in or relating to reinforced concrete construction.

Percy Edward Correll.—Improvements in head lamps for vehicles and the like.

Tom Cutcliffe.—An improved concrete or like building block and method of making the same.

Alexander Thom.—Improvements in the water connection for axial water fed rock drill machines.

Edgar Allen and Co., Ltd.—Improvements in apparatus for mixing, circulating and agitating materials in a liquid or semi-liquid state.

Gideon Efraim Sandblom.—Improved scale or incrustation removing apparatus; improvements in apparatus for removing boiler scale or the like.

Charles Algernon Parsons.—Improvements in glands for packing rotating shafts.

Herbert Kempton Dyson.—Improvements in or relating to slabs, plates, and the like for floors, roofs, walls, slips, vehicles and other structures.

Alfred Hubert Roy Fedden and Leonard Frederick George Butler.—Improvements in or relating to cylinders for internal combustion engines.

British United Shoe Machinery (S.A.), Ltd.—Improvements in or relating to cutting, punching and like machines.

William George Lester, Lindsay Claude Naeser and William John Pullock.—Improvements in nut locks.

Charles Boyd Varty.—Improvements in pump rods.

Samuel Rowlands Parkes.—Improvements in rim locks and latches and in the manufacture of the same.

George Yirrell.—Improvements in wheel axles, and bearings of trucks for mining and other purposes.

Walter Robinson Greathead.—Device for indicating the direction and speed of air craft.

Harry Leonard Hendrick and John Adrian Vermaak.—An improved ventilation door for use in mines.

Daniel Tait.—Improved composition plate for ceilings, well partitions and the like.

William Martin.—Rope measuring instrument.

The South African Wire Co., Ltd.—Improvements in or relating to gates and the like.

Fullerton, Hodgart and Barclay, Ltd., and William McGregor.—Improvements in and relating to air compressors.

George Kent, Ltd., and Arthur Douglas Deane-Butcher.—Improvements in or relating to means for electrically signalling the movements of recording instruments.

Ulric Duchesne and Charles Arthur Gareau.—Back pressure brakes.

Mogens Louis, James Hansen and Thomas Bethell Caldwell.—Improvements in flexible pipe lines.

Harry Alexander Stenning and Herbert Paine Bray.—Improvements in and relating to steam super-heater elements.

Naamlooze Vennootschap "Pinlock" Maatschappij tot Exploitatie van de verligheidsmoer volgens de Buiten-Europeesche Patenten "System van der Valk en van Eck.'—Improvements in lock nuts.

Samuel Davies.—An improved hand-soldering tool.

Hugh William Gabbett.—Improvements in automatic or semi-automatic firearms.

Joseph William Finney.—Improvements in reciprocating pumps.

Noel Yeo Robertson and Herbert Moss.—Improvements in pipe connections.

William Allen.—Improvements in rock drill mountings.

George Frederick Piper.—Jacks lubricator for lubricating rams, pistons and packing.

Cornelis Fredrik Delfos and James Wilshir.—An improvement in cocks or valves.

Joan Devigue Williamson.—A postcard with circles either cut or outlined to be cut for finger to go through.

Charles Walter Wiley.—An improved hairpin.

Gabriel Christian Erasmus Keet.—Improvements in machines for making horseshoes or the like.

John Watson.—A revolving advertising machine.

Gert Wilhelm van Rooyen.—Van Rooyen's petrol consumption reducer.

James Henry Jerrim.—Improvements in machine and other vices.

Allan Edgar Jeans and Peter Thomas Hayes.—Apparatus for automatically feeding the melting pots of type bar-making machines.

James Davidson Sloan and David Sloan.—Improvements in and relating to water wheels.

Ernest Vayghan.—Improvements in or relating to means for effecting the attachment and detachment of pneumatic tyres to and from the wheels of automobiles and other vehicles.

Buenaventura Junquera.—Improvements in the manufacture of concentrated solutions.

George Peter Wigginton.—Improvements in loose sheet devices.

Ernest Tribe.—Improvements in and connected with pipe joints.

Horace Scott Laycock and Percy John Ogle.—Improvements in warning and ventilating gas stoves.

Aktiebolaget Kvafveindustri.—Improvements in processes for carrying out chemical reactions between gases and solid substances at high temperatures in continuous working.

Aktiebolaget Kvafveindustri.—Improvements in processes for carrying out chemical reactions in the presence of metals in a finely divided form.

Algernon Bertie Louis Crowe.—Improvements in sound reproducing and recording machines.

Thomas Edgar Richards.—Improvements relating to structures.

Francis Joseph James Gibbons.—Improvements in metal window frames and sashes of the sliding sash type.

Urlyn Clifton Tainton.—Method of roasting ores or concentrates.

Walter Harrison Biddle.—Improvements in or relating to railway and similar signals.

Harry Craighall Badder, Spencer Freeman Burrows and Henry Lewis Phipps Allender.—Improvements in and connected with compositions for and the production of waterproof cements, concretes and mortars.

British United Shoe Machinery (South Africa), Ltd..—Improvements in or relating to methods of and means for the manufacture of boots and shoes.

British United Shoe Machinery (South Africa), Ltd.—Improvements in or relating to skiving machines.

Roland Briggs.—Improvements in and connected with children's comforters.

Alfred Walter Alexander Barnard.—An improved safety device for fowling pieces, rifles, and the like.

Henry Petrie Fletcher.—Means for the conversion of water pastes into oil pastes by chemical and mechanical action.

Ernest Fenerheerd.—Improvements in and relating to rotary engines, rotary pumps, air compressors, and the like.

Muirs Proprietary, Limited.—An improved process for the manufacture of small spiked metal articles such as horse nails and the like.

Thomas Edwards Bond.—Improvements in rope-supporting rollers.

Sigismund Rudolph James Maynard.—Improvements in securing axial water tubes in rock drilling machines.

Charles Henry Armistead.—Improvements in moulding pipes and like hollow bodies from concrete, clay and the like.

Cecil Robert Wheeler.—Improvements in coin-freed and electro magnetically-freed apparatus especially adaptable to telephones.

George Wilson.—Improved fishplate for railway rail connections.

Lucien Linden.—Separating the respective lighter and heavier matters from a flowing liquid.

Noel Pemberton Billing.—Improvements in or relating to domestic heating and cooking apparatus.

Noel Pemberton Billing.—Improvements in or relating to stoves.

Buffalo Speciality Company.—Polishing mops.

Walter John Compton.—Improvements in toys.

Laura Helena Mary Funston.—Improved means for attaching wearing strips, pads or the like to boots and shoes.

Automatic Telephone Manufacturing Company, Limited.—Improvements in or relating to impulse transmitting devices for use more particularly in connection with automatic or semi-automatic telephone systems.

Marconi's Wireless Telegraph Company, Limited.—Improvements in receivers for wireless telegraphy.

William George Cook.—Improvements in concrete slab buildings.

Vickers, Limited.—Improvements in or relating to intermittent driving mechanism.

The Pyle-National Company of New Jersey, U.S.A.—Improvements in motor generator sets.

Robert Elcock.—Improvements in combination locks.

Denham Ralph Robinson.—Improvements in vessels for holding and delivering powders and finely divided materials.

William Edwin Bleloch, Charles James Tutt and Edward Godfrey Bryant.—Improvements in the extraction of potassium nitrate or other soluable salts from earthy material.

George Wilson.—New connection end for railway line metals, and fishplate for connecting the same intended for the purpose of stopping all shocks, jolting and vibrations while travelling.

General Electric Company.—Improvements in and relating to unidirectional radio receiving systems.

George Elgin Richardson.—Improved vulcaniser.

The Efficient Gas Power Company, Ltd.—Improvements in and relating to suction gas generators.

Sidney Talbot Langdon.—A pivoted oscillating jockey.

David Heller.—Improvements in indicating the movement of distant movable bodies.

Henry Selby Hele-Shaw.—Improvements in hydraulic clutches or couplers.

Naambooze Veenoatschap Algemeene Norit Maatschappij.—A new or improved process for the purification and separation of filtration of liquids or liquors.

Do.—Process for the regeneration of decolorising carbon.

Do.—A new or improved process for the sterilization and purification of water.

Do.—A new neutral and sterile decolorising carbon adapted particularly for sanitary and medicinal uses.

Do.—Improvements in or relating to decolorising or purifying processes and discolorising carbons therefor.

Do.—Improvements in filtering, decolorising and purifying processes for liquids and liquors, juices, liquified bodies and the like.

Louis Le Warner Hamon.—An improved fuel.

Fullerton Hodgart & Barclay, Ltd., and William McGregor.—Improvements in and relating to the valves of pumps.

The British Westinghouse Electric and Manufacturing Co., Ltd.—Improvements relating to axial flow steam turbines.

Louis Denis.—Improvements in the manufacture of refractories.

TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Timber and Building Materials—Bricks, Cement, etc.—Iron, Steel and Machinery—Electrical Goods—Oils and Colours—Hopes of Big Strike Settled.

The railway strike in England has been practically the only subject of discussion amongst the commercial community. Whilst everyone regrets that such a catastrophe should happen in Britain, yet naturally the conversation turns as to how this great railway strike would affect South Africa. It may be mentioned that the Stock Exchange took the matter rather badly on Monday, but when it became known that the British Government had accepted the challenge of the Trades Unions concerned values steadied up and in most cases resumed nearly normal. The subject for the mining material merchants took a different trend, and prices for material went a little harder, because it was felt that South Africa would have to depend more and more on Canada and America. But what was of more importance was that a new feature was brought into notice. A usually well-informed party said that in consequence of the world-wide turmoil in the labour market something was already being done here to introduce new undertakings for industries and manufactures, and so save freight and keep money in the country. One pertinent question was asked: Whether he was aware that an order for £40,000 worth of furniture had been placed in Capetown from a London furniture house? He admitted that he understood such was the case. This being an important subject, another gentleman who should know said, on being questioned, that he was not prepared to discuss the matter, but undoubtedly there was something in the wind as regards developing new industries. One great reason was that in consequence of the high wages and the almost universal strike position, it was now South Africa's great opportunity to encourage new enterprises of all kinds. He was also asked for an inkling as to what these undertakings would probably be. He remarked something about the Pretoria iron works going in for big things, also that the Dundee glass works, for making bottles, was making good progress towards a start, as it had already purchased steam power and other machinery for the undertaking. Also Mr. Eaton had commenced a large iron works in Natal, which would be ready at the end of the year. Hitherto many people have been nervous about the world's competition in killing everything South African, but with the great upheavals, opinions have turned about in the opposite direction. A manager of a grocery store recommended some of his friends to put money into the bacon trade, when the idea was pooh-poohed, but to-day we are actually sending bacon to that critical market of London, and much of the bacon has been appreciated. The South African boot people have also been coming much to the front, amidst much adverse criticism as to the wearing of boots made in this country, but now that the imported boots have risen to such extraordinarily high prices the South African boots, at less than half the price, are being given a trial and one hears now and again that they are not so bad after all.

Timber and Building Material.

The supply of deals is practically nil throughout the country in wholesale quantities, but shipments are on the way and nearing South Africa. These are, however, not well distributed amongst the timber dealers, because of the strikes in Norway and Sweden delaying some of the ships loading. Therefore only a few yards will benefit in the immediate future, but according to the latest cables other ships are coming forward, therefore supplies of timber are expected to be fairly plentiful during October. The price of deals in Johannesburg is 1s. 8d.—1s. 9d., also 1s. 10d. per ft. for small lots; floorings, 8½d. to 8¾d.; and ceilings, 6d. to 6½d. Galvanised roofing iron is dearer at 1s. 5d. and 1s. 6d. per ft. The hopes entertained of getting iron cheaper have not been realised, as the shipping is so erratic, as well as loadings in Britain. At present the unhappy conditions prevail of merchants having to purchase from one another, owing to some receiving consignments and not others. Business is exceptionally good in the sawmills and yards throughout the town and the Reef; in fact has never been better for a very long while. It is only restricted on account of the shortage of stock and in a lesser measure owing to high prices. The question of prices does not weigh over much as the building public has taken its confidence in both hands and is going right ahead for the many contracts in hand.

Bricks, Cement, etc.—Bricks are very scarce indeed, and it is practically impossible to supply all requirements. Prices have a tendency still to harden as the brickyards are refusing orders daily. A leading broker tried to place an order for 300,000 for a month hence, but could not get same accepted by any yard. Labour is not so troublesome a factor as it was about a month or six weeks ago. The demand for bricks is very great indeed, as the amount of building going on is very large and continuously growing. The cement position is, if anything, more acute than last week and it is absolutely unobtainable. A small parcel of cement was sold at an auction mart during the week at the enormous price of 21s. per bag.

Iron, Steel and Machinery.

A brochure on steel is issued by an American firm in no fewer than twelve languages from English to Chinese and Japanese, so that each individual, whatever his language, can read it and be personally approached. Another subject in which America is taking a leading part is in pushing the smaller gas, electric and oil motors, of which Johannesburg has an abundance at the moment. A British engineering firm was offered a special agency for similar motors but could not accept, as the prices quoted at the English factory are on a par with what Americans are selling retail at in Johannesburg. In the pre-war days the English made motors commanded a little better price, but not such a difference as is ruling in present price lists. Another feature worth mentioning was an indent put up in the Commercial Exchange on Wednesday by the Railway buyer who asked for the best Yorkshire or Dunswart iron. Now, to mention our own Dunswart in the same paragraph as the best Yorkshire is a feather in the local iron industry's cap—Dunswart being a Johannesburg company with its works on the Reef. The strikes in England and America have caused prices to firm up in iron, steel and all hardware goods. This may or may not be permanent, as there are sure signs of the steel strike in America collapsing and the English railway strike shows some promising signs of arrangement, as the workers are having a conference with the Premier. Up to about two months ago ½ in. and ¾ in.

galvanised iron piping was sold much below cost of landing, but recently it has gone up quite a penny per foot, making all the difference between loss and profit. However, there are quantities of outside sizes still a bit of a drug in the market. And also bar iron of small sizes was sold below cost some three months ago, but since then a twenty per cent. advance has taken place from the lowest price touched. Steel plates a short time since were ruling at £35, but are now £47½ per ton. There is an excellent demand for boilers from 10 to 35 h.p. of the loco. type, which are realising excellent prices. There are a few multi-tubular boilers that can be had at reasonable figures. There has been a little demand for diamond washing plants, which, however, are very scarce and dear. The outside mines, such as tin and coal, are better customers, as Natal is doing more business through Johannesburg of late on account of the assortment of mining material being better here than in Durban. Brass rods are 2s. 9d. per lb.; imported mild steel, 41s. Carbide is 55s. per 100 lbs. and lamps 11s.

ELECTRICAL GOODS.

There is no change to report in prices, although lamps are firming up again and are said to be sure to go higher. Notwithstanding stocks of tubing received and consignments on the water, dealers are viewing future supplies of this article with feelings akin to dread. In face of the demands, which are very great (one leading dealer has during the past six weeks disposed of some 60,000 ft.), the stocks on hand and expected shortly are practically only a drop in the ocean, and the present great railway strike in Great Britain is anything but encouraging in this respect. The demand for materials in town and country (especially Kimberley) is very good. A prominent dealer in reviewing the present upheaval at Home said his conviction was that the workmen, in regard to their demands for increased wages, etc., were leading straight for bankruptcy.

OILS AND COLOURS.

Canadian white lead is dearer at 75s. per 100 lbs. and English genuine at 90s. to 95s. Linseed oil, Indian, is 90s. for raw and 95s. boiled. Turps, two-fours, 90s. and tenones 100s. Cylinder oil, 42s. to 48s.; and engine, 37s. to 46s. The usual trade circulars are not forthcoming for October, as prices and conditions are much the same as those in September. All glass is fairly plentiful, but the demand is great; however, there are no fears of any scarcity, although the latest news from England is not encouraging for the future. But if perchance that source is not available, Canada and America will come in with supplies. Plate glass, 6s. 6d.; mirror, 8s.; and window, 1s. 9d. for 16 oz. and 2s. for 21 oz. It is expected that wallpapers will be sixpence per roll cheaper from January 1, 1920.

FEW NOTES ON GOVERNMENT CONTROL.

The following have been fixed by the Government:—Petrol: Government Notice 1,506 of 19th Nov., 1918, fixes the retail prices of petrol, benzine or motor spirit for inland towns, which plus transport charges and railage, works out for Johannesburg at £1 19s. 3d. per case of two tins, each containing 4 Imp. gallons; smaller quantities in bulk at the rate of 5s. per Imp. gallon, and in the case of what are known as gallon tins at the following prices: "Shell," 5s. 9d. per tin of Imp. gallon; "Pegasus," 4s. 6d. per tin of 5-6ths Imp. gallon; "Zenith," 4s. 6d. per tin of 4-5ths Imp. gallon.

Paraffin: Government Notice 1,507 of the 19th Nov., 1918, lays down the price to the inland consumer of 150 degrees paraffin as 20s. 9d. per case of tins (each 4⅛ Imp. gallons), or 10s. 6d. for one tin, or 25s. 3d. per case of 10 tins, or 2s. 8d. per tin of 5-6ths of an Imp. gallon, plus railage and transport charges (prices include cases and tins). It has been ascertained that the railage and cartage from Durban to Johannesburg, for a whole case is 3s. 9d., so that the retail price for the two tins should not exceed £1 4s. 7d.; large tin half that amount, and small tin 3s. 1d. 125 degrees paraffin are fixed at 3d. per case less. The bottle price for inland towns is 6d. (consumer to supply the bottle).

Matches: Government Notice 398 of 17th March, 1919, fixes the price of the ordinary small box of matches at 6d. per packet of 12 boxes, or 2d. for 3 boxes. For the large size box, 8d. per packet is fixed, or 2d. for 3 boxes.

Sugar: Government Notice No. 734 of 4th June, 1919, provides that the maximum retail price of sugar shall be 4½d. per lb. for inland centres.

Rice: Government Notice No. 1,108 of the 22nd August, 1919, prescribes the price of white rice, retail, to be 6d. per lb., plus transport. White Siam rice is 8d. per lb., plus transport. By the wholesaler: Brown rice (of all kinds, except Madagascar), 60s. per bag of 164 lbs.; Madagascar rice, 47s. 6d. per bag of 164 lbs. By the retailer or any other person: Brown rice (of all kinds, except Madagascar), 5d. per lb.; Madagascar rice, 4d. per lb. The prices are to be for rice free on rail at the port of entry. Persons selling elsewhere than at the port of entry will be entitled to add the cost of transport to the price.

The Cost of Living Commission, in view of additional increases in the cost of raw materials, has agreed to a further increase in the manufacturers' price for soap of 20 per cent. as from this date. In view of the stocks purchased at the lower prices and held to-day by merchants and retailers, the price to the consumer should not increase for some time to come.

The ZANETIC BRAND of TYPECARBON is the supreme embodiment of all the practical excellencies required by business houses.

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TYPEWRITER CARBON.
BLUE LINE. MEDIUM WEIGHT.

The **Superfine Standard Weight** (purple) stands out pre-eminent as the long-wearing grade, while during its whole life the copies given are perfect.

For general commercial use it's easily the most economical.
Samples of this and other grades on application to the Makers.

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who make the celebrated Zanetic Penduplicating Paper.
Any dealer can supply.

ASBESTOS

HOBDELL WAY & CO., LTD.
MINORIES, LONDON.
Cables: "HOBNAILS."

Company Meetings.

SIMMER AND JACK.

Mr. C. Hely-Hutchinson presided at the twenty-first annual meeting of shareholders in the Simmer and Jack Proprietary Mines, Ltd., held on Sept. 26, and in moving the adoption of the report of the directors and the statement of accounts, said: In common with most other gold mining companies, we have passed through a bad year. The reports before you show that, on a reduced tonnage, the total working costs have increased and that there has been a falling off in grade. The nett effect is a profit of £62,500 as compared with £195,000 for the 12 months ended 30th June, 1918, a reduction of £132,500. During the year the company has paid off a further £22,400 in respect of the 40 claims acquired from the Simmer Deep, leaving a balance of £7,200, which is not necessarily due until 31st December, 1921. Capital expenditure of £37,000 has been met, principally on the equipment of the Rhodes Shaft, and a dividend of 1¼ per cent, absorbing £37,500, has been declared as compared with 3¾ per cent. for the previous year. The company has been able to meet the above expenditure partly out of the balance available from the year's profits, partly by using the whole of the renewals fund, on which, at 30th June, 1919, there was a balance of some £10,000 and which you will notice has now disappeared from the balance sheet, partly from a sum of £16,000 which was received in respect of fire insurance after the fire at the workshops, and party by the release of cash previously locked up in stores and payments in advance. In this connection you will note from the balance sheet that the value of stores on hand has been reduced by some £12,000 and payments in advance by some £11,000, the latter being principally due to the reduction in the amounts deposited with the Central Buying Department of the Chamber of Mines on cyanide, zinc, and mercury contracts. With regard to stores, it will no doubt be possible to affect considerable further reductions in stocks carried as shipping and industrial facilities return to normal. The form in which the balance sheet is presented to shareholders this year has been changed in order to reflect clearly the expenditure of capital moneys on capital assets. In order to bring this about it was necessary to appropriate the sum of £49,397, which was the amount by which expenditure on capital assets exceeded the company's capital moneys as at the 30th June, 1918. The remainder of the items in the balance sheet are normal and require no explanation. The balance of £106,000 on the appropriation account is represented by an excess of cash assets over liabilities to the extent of £17,000, and as to the balance of £89,000 by investments, payments in advance, stores, livestock, vehicles and furniture, etc. The report of the consulting engineer sets out the position with regard to ore reserves. It has been necessary to eliminate a considerable tonnage from previous reserves owing to the necessity to take a higher pay limit. During the year we have been able to continue drawing profitable tonnage from the outcrop sections and this will probably continue to be the case for some time. Your attention is drawn to the consulting engineer's reference to the No. 3 (or Eastern deep level) section, which, during the past year has furnished us with about 20 per cent. of our tonnage.

Rhodes Shaft.

By the end of 1919 the Rhodes Shaft is to be ready for delivery of ore. This shaft has a capacity of 30,000 tons. It will serve the new claims, which can be drawn upon as soon as the shaft is ready, and will also deal more economically with certain ore which is at present being dealt with through Nos. 1 and 2 shafts. The tendency, as times goes on, will be that work will concentrate to a greater extent than hitherto in the south west portion of the mine and on the new claims. For the current year, and for the future generally, I think we are safe in anticipating improved results towards which the new Rhodes shaft area would be expected to contribute materially. The company's life is not of course a long one. The shortage of trained European employes which has hampered our operations during the war period and more particularly during the past year, will tend to be remedied by the return of men from active service and we hope, as a result, to be able to get better efficiency. In common with everyone else we suffered severely during the past year from the effect of the influenza epidemic on our natives. The supply has not yet returned to normal, the number at present in our employ being approximately two-thirds of our requirements.

In this connection you will no doubt have seen that the Low Grade Mines Commission, in their interim report recently published, have made certain general recommendations for altering the Mining Regulations with a view to improving native efficiency by making a fuller use of the time spent underground, and have also brought in a recommendation for the temporary employment of tropical natives. The arguments with regard to the latter are too well known to require repetition and we hope the Government may agree to act on the Commission's recommendation. We can look to a gradual, if slow, reduction in the cost of stores and materials. For the year under review the company spent under this head £237,000 (about 7s. 10d. per ton). Compared with the year 1913-1914 this is an increase of 3s. 6d. per ton, or say 80 per cent. Costs in this connection have already fallen, though the company has not as yet felt any material benefit owing to its having had to keep large stocks of materials bought at high prices which are only now being worked off.

Sale of Gold.

The recent arrangements for the sale of gold are proving of considerable advantage to producers. Few, if any, of us are sufficiently in touch with the factors which affect international exchanges and enable us to obtain these premiums on our product. This is a highly specialised sphere of business. It is consequently impossible to give you any estimate of the extent or the period for which we are likely to benefit in this connection. All one can say is that for so long as it lasts it is a favourable factor. Against this, however, we must take into account the effect of the new phthisis legislation, which is estimated to cost this company some £60,000 during the next five years, in addition to what it would have paid under previous legislation. It is difficult to believe that important legislation of this kind should have been passed through the House without any accurate previous calculation of its financial effect, especially at a time when the precarious position of the low-grade mines was public knowledge. This, however, was the case.

Of the total of 203 employes of this company who have been on active service during the period of the war, 21 have either been killed or have died in captivity, 160 have returned and have been re-employed, 2 have returned but have elected to take up other employment, and 20 are still away. In addition to the 21 who have been killed, 41 have received wounds during their service. Two of the company's employes have been honoured by the King, viz., Captain R. H. Crichton, who has received the Military Cross, and Private S. Tucker, who received the Military Medal. The company can be proud of the record of its employes from the beginning to the end of the war. We welcome the return of these men to the company's service. They come back in the majority of cases fitter both physically and mentally, and with an outlook broadened by their experiences on service, and will no doubt bring a steadying and wholesome influence to bear on the relations between the company and its employes. While acknowledging our gratitude to them for their part in the successful conclusion of the war, we must not forget the faithful and willing services of those of our employes who could not be passed for active service, or who could not be spared for fighting, but had to remain here and keep the mine going. The company's thanks are due to Mr. C D. Leslie, the consulting engineer, and to Mr. C. H. Greathead, the manager, and his staff at the mine, for their loyal and efficient service during the period.

He moved the adoption of the report and accounts, which was seconded and carried. The retiring directors were reelected.

PRETORIA CEMENT.

The 24th annual meeting of the Pretoria Portland Cement Company was held on September 25. Mr. H. C. Boyd presided, and there were also present Messrs. C. Bromley, C. Maggs, J. Smythe, S. J. Lunnon, E. Davidson and M. Bird (secretary).

The Chairman, in submitting the report and accounts for the year, said they reflected the continuous progress made by the company. The net profit was increased to £129,354, mainly owing to the increased scale of operations. Two dividends of 10 per cent and 12½ per cent. respectively were paid on the enlarged capital which was now £300,000, and an appreciable expenditure on the first extension of No. 2 factory was made. Although the position in regard to the supply of raw materials was eminently satisfactory, it had been thought advisable to take advantage of the favourable opportunity which offered to acquire a deposit of shale and another of limestone conveniently situated in relation to the factory.

At the last annual meeting, he had indicated that it was their intention, if possible, to increase further the productive capacity of No. 2 factory by the addition of a third kiln and accessory plant. In pursuance of this, Mr. Davidson, the general manager, spent a great part of last year in the United States, making the necessary inquiries, and they must congratulate him on the success of his efforts. Some of the plant had yet to be received, but the new kiln was on the property, and, all being well, they might hope to complete this extension which would increase the factory's output by 50 per cent., by about March next. This extra output would be very welcome in view of the ever-increasing demand for their product. The estimated cost of the extension mentioned in the directors' report a material part of which has already been made—would be exceeded by at least £30,000, partly owing to advanced prices of all materials, but more, because of additional plant ordered, and the necessity of providing further housing accommodation for their employes. With their five large kilns at work, they would be producing cement on a very substantial scale, but it was doubtful if they would even then succeed in fully meeting the demands made upon them. The requirements of the country were steadily growing, and the Board, after careful consideration, had decided to embark on yet further extensions of No. 2 Factory. Shareholders would shortly be communicated with by circular on the subject, as it would be advisable to meet the very considerable expenditure involved by the creation of new shares. Current operations were proceeding smoothly. They had recently been somewhat hampered by scarcity of native labour at one factory, but they had really very little to complain about. The Board would again express its high appreciation of the valuable services which Mr. Davidson, the general manager, Mr. Bird, the secretary, and the staff generally, continued to render them.

The chairman then moved that the directors' report, balance sheet and accounts for the year ended June 30th, 1919, be received and adopted. This was unanimously agreed to.

The retiring directors, Messrs. H. C. Boyd, S. Marks, C. Maggs, J. Jeppe and S. J. Lunnon, were re-elected, as were the auditors, Messrs. Alex Aiken and Carter.—Special.

SWAZILAND TIN.

Mr. H. C. Boyd, chairman of the Swaziland Tin, Ltd., in moving the adoption of the report of the directors and the statement of accounts at the annual meeting of shareholders on Sept. 26, said: The influenza epidemic in November and December and the inability through unavoidable lack of spares to run all three gravel pumps continuously, combined to reduce materially the cubic yardage treated, the monthly average being just under 91,000 yards. The yield of metal per yard fell by about .07 lb., and the averaga price realised per ton of tin recovered was about £241, against £301 as compared with the previous year. The increase of nearly .7d. per yard in the working costs was almost solely due to the increased price which had to be paid for stores and material. These adverse factors resulted in the profit for the year being reduced to £15,595, from which two dividends, absorbing £12,300, were paid. The net expenditure on capital account was just under £3,500, as detailed in the directors' report, the most interesting item being the purchase of a concession, which we have reason to believe contains deposits of value conveniently adjacent to our Lower Mbabane workings. At the last annual meeting I indicated its position in regard to the excess profits tax. Unfortunately, the hopes then expressed of our receiving equitable treatment were not fulfilled, and, as the report explains, we have, in spite of the fullest representation on the subject, been assessed at £3,864 more than we had provided for in the 1918 accounts. As we weref advised that the chance of legal redress was remote, we were forced to the conclusion that the position must be accepted, and in the accounts before you provision has been made for this adjustment and for such taxation as may be levied in respect of the past ear even on the higher scale adopted by the Swaziland authorities. In the absence of the Consulting Engineer on holiday, the usual full details of the past year's work are contained in the manager's report. Foy's Creek and a portion of the Alice Creek area yielded lower values than anticipated, and with the reduced metal price and higher costs prevailing at the close of the year it was necessary to remove, provisionally at least, a considerable yardage of the previously proved ground from the reserve, which is now estimated, with the addition of other areas tested during the year, to be just under 2,780,000 cubic yards, as against 3,530,000 yards in the previous report, while the average metal contents are estimated at .58 lbs. per yard, a reduction of .1 lb. per yard. Considerable areas yet remain to be tested, and this work is preceeding as rapidly as circumstances permit. Drilling is at present concentrated on the Lower Mbabane Flat, where the values continue good.

Restricted Output.

As the directors' report explains, from the beginning of this financial year the output declared for each month will be the amount of concentrate actually bagged in that month, and not as formerly the quantity estimated to have been recovered As a consequence, there was no output declared for July, while the output for August of only 27 tons had to bear the costs of two months. With credit adjustments in respect of previous shipments a loss of £528 was shown for the period, but, as the output has since been sold at £272 per ton, this loss is reduced by some £400. The low output is accounted for by the fact that at present there is a severe shortage of native labour, possibly due to there having recently been a mild recurrence of influenza. The output for July was, as a consequence, only 80,000 cubic yards, and that for August some 77,600 yards. Doubtless this will correct itself shortly, and we may expect to reap the benefit of the better tin prices at present ruling. We desire to acknowledge the good services which Mr. Kelly, the manager, and the staff continue to render us.

The motion was carried unanimously, and the retiring directors were reappointed

McCREEDY TINS MEETING.

Speaking at the annual meeting of Mc-Creedy Tins (Swaziland), Ltd., Sept. 29, Mr. J. Jeppe said that in the absence of the chairman, Mr. Graumann, in Europe, it devolved upon him to address the meeting on this occasion. "You will have observed from the accounts," said Mr. Jeppe, "which are before you that the past year has not been a good one for the company, inasmuch as the operations have resulted in a net loss of £1,686 18s. 11d. The causes which have contributed to this have been various. We have had considerable difficulty with the water race, there being serious breakaways, causing considerable interruptions to work in four of the twelve working months Then, again, the influenza epidemic practically caused a suspension of operations for two months in the year. As a consequence thereof your output of tin concentrates decreased from 37 tons to 27, and this was accompanied by a considerable decrease in the average price of tin compared with the previous year, and an increase in the price of all stores and supplies. We are also very much hampered by the difficulty experienced in getting our concentrates to railhead. Transport is unobtainable sometimes for weeks, and generally when we want to ship on account of the high price offered. Under our contract we are bound to ship within a month of the date of sale, which prevents us, under the circumstances, taking advantage of the market as we otherwise might. With regard to the future prospects of your company, what it needs is increased output and opportunity for expansion. With the present condition of your property after being worked for many years it has arrived at the stage when the cost of working, apart from war causes, is likely to increase, and necessitate considerable expenditure on extra plant which your manager has been pressing for some time past. Under these circumstances your directors have thought it their duty to call a special meeting of shareholders at an early date to consider an offer which has been received for the reconstruction of your company, which will include the acquisition by you of certain mineral concessions, portions of which immediately adjoin your property, these having been previously reported on very favourably by your manager. I will not, however, go into these matters at present, as full particulars will be given you at the meetings referred to. I would like to pay a tribute to the zeal and energy displayed by your manager, Mr. J. W. Reilly, who has had to contend with great difficulties in the working of your property, and but for whose efforts I feel sure your financial position would have been less favourable than it is, and also to your secretary, Mr. Dowling, and his staff for the ability and constant attention they have shown in the performance of their duties."

The report and accounts were adopted. Messrs. E. M. Hind and E. Jacobs were re-elected to the directorate, and Messrs. F. W. Diamond and English reappointed auditors.

The Employment Question. Notices or advertisements of appointments vacant on the mines or elsewhere, so long as the employment will be first offered to a returned soldier, will be published free of charge in the *S.A. Mining Journal*. In order to assist the mine secretaries to make known any vacancy for a returned soldier, a free copy will be sent weekly to every mine secretary who forwards his address to this office.

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Notes and News

The Coming National Labour Conference.

It is officially announced that the Government has definitely decided that the National Conference of employers and employees in South Africa is to be held in the Provincial Council Chamber at Pretoria, opening on November 3rd.

* * * *

Union's Mineral Output.

The mineral output of the Union for August was valued at £4,255,181, a decrease of £189,894 on the July return. The diamond output was 199,037 carats, value £928,346, a decrease of 22,081 carats and £46,290 in value. The coal output was 824,596 tons, value £265,605, being a decrease compared with July of 188,885 tons, and £15,562 in value. The Transvaal produced 544,930 tons, an increase of 30,175; Natal 196,084 tons, a decrease of 45,486; Free State 73,205 tons, a decrease of 3,482; and the Cape 387 tons, a decrease of 32 tons. The sales and shipments of tin were 189 tons from the Transvaal and 3 tons from the Cape. Silver recovered in the course of gold mining came to 74,079 ozs., value £18,526. The labour returns show that 36,095 whites were engaged on mining, an increase of 1,606, and this is the highest number of whites recorded for the past few years as being employed in mining. The number of natives at work was 259,634, a decrease of 2,303 on the July figures.

* * * *

The Mines and Other Industries.

The Executive Council of the South African Federated Chamber of Industries submitted an important statement to the Low-Grade Mines Commission this week. The statement pointed out that the Executive Council claimed no technical knowledge of the difficulties of the gold mining industry. The Council desired to draw the special attention of the members to a striking fact in connection with the amount of money circulated by the payment of white and native wages and stores. The total amount circulated in the payment of these three items of expenditure by the mines of the Witwatersrand alone during the year 1918 was £27,022,869, of which the 22 low-grade mines paid no less than £10,707,025. The point the Executive Council desired to impress upon the Commission was that all this expenditure was new money, added wealth to the Union and Empire. In ordinary businesses the expenses of running were met out of profits on turnover, whereas the cost of mining was met by the gold produced from the operations. The Council concluded with a powerful plea for State aid for the Rand gold mining industry.

* * * *

East Transvaal Tins.

The secretary furnishes us with the following resume of the work accomplished to date. The company's claims, 1,200, on Oshoek, mining district of Barberton, are situated on the main belt of tin-bearing granite, to the west of the Swazi Tin Company's property. The work done since May, when I took over the management, consists of prospecting, testing the various creeks and terraces, cutting water races, and generally preparing for the work of tin winning. The watershed of the Makwana Range to the west and on the Mabusa to the north, over a large area, yields high quality tin. Both shed into the Makwahuma River, and as we have sufficient water supply, the facilities for working are good, there being a good fall to the river on both sheds. The Makwahuma has nine creeks or tributaries on the company's claims and while all show payable tin, some of them are rich. The Makwahuma itself carries a good quality tin for a distance of one and a half miles, but I am, for the present, confining my attention chiefly to the creeks and terraces. Summarised, the work done is as follows: Trenches cut, 100 yards; ground worked, 90 yards in length; water races cut, 3 miles in length; prospecting shafts sunk, 56; dams built, 5. Under date September 27th Mr. Lewis reports a promising strike of tin-bearing gravel on No. 1 creek south, and Mr. James Cumming, the managing director, is now on the property to inspect this strike and plan with the manager its development.

African Oil.

The African Oil Corporation, Ltd., has been formed with a capital of £100,000 in 200,000 shares of 10s. each, and is likely to be on the market shortly. Its prospects are considered good, and advantageous options have been acquired by the company over big areas known to contain oil seams. The directors are Messrs. H. Pratt, W. P. Fisher, J. F. Ferguson and D. Wilson, and Mr. J. E. Mills Davies is the consulting engineer.

* * * *

German Tin Shortage.

A United States commercial report states that Germany has been suffering from a shortage of tin during the war. Substitutes were used wherever practicable, and everything possible was done to utilise old tin and scrap. Among other expedients a kind of lacquer, consisting of a solution of phenol and cresolin with formaldehyde and alkali was excessively used. An alloy composed of zinc, cadmium and lead is still being employed as a substitute for tin for various uses. Works have also been extensively engaged in the recovery of tin by means of mechanical, chemical, and even electrolytical processes. Large quantities of tin have been recovered from discarded empty tins, and also from clippings found in old dump heaps. One of the most striking measures taken to secure tin from domestic sources was a proclamation in January, 1917, ordering the confiscation of organ pipes made of tin. Exception was made only in the case of organs declared by duly authorised experts to have special intrinsic or historical art value.

* * * *

American Capital and the Removal of Treasury Restrictions.

The American Chamber of Commerce in London, in the course of a note addressed to its associates in the United States of America, points out that British securities held abroad can now be sold on the British Stock Exchanges, provided the securities have not been in enemy ownership since the outbreak of the war. The effect of this Treasury decision, says the Chamber, is to give decided encouragement to Americans wishing to invest in British securities, and it expresses the hope that full advantage will be taken of it in the United States. Hitherto the American purchasers of British securities have been faced with the handicap that they could not realise these securities on the British Stock Exchanges should they desire to do so. Now, however, the restrictions have been entirely removed. The restrictions have also been removed by the British Treasury from the export of capital from the United Kingdom. Remittances can now be made abroad for the purpose of subscribing to a loan or issue of capital or for the purpose of purchasing securities or other property. Hitherto money could only be remitted for the purpose of buying merchandise or foreign currency to be held as an investment. The American Chamber adds that the Treasury's removal of the war time restrictions on financial operations and the Prime Minister's announcement that the import restrictions are almost entirely to be discontinued after 1st September are widely welcomed, although there is much disappointment at the indefiniteness of the Government's other policies revealed (or rather not revealed) by the Prime Minister.

* * * *

The Boom in Diamonds.

There is really no change to report in the conditions of the diamond trade, says the *Financial News* in mail week. The Diamond Syndicate has shown nothing, but that does not, of course, affect the position, and the demand is still as keen as ever both from the Continent for rough goods and from America and elsewhere for the finished article. Cutters in Holland and Belgium are almost despairing as to their autumn requirements, and, as the public demand is increasing, these merchants are naturally keen on keeping their works supplied. Some of them are expressing the hope that the producers will increase the quantity of diamonds for sale, but we fancy they are building on a false hope. We believe there is no intention to depart from the policy that has been laid down. We mentioned last week that, owing to the world-wide demand for the stones, it was not at all improbable that a further rise in price would take place. Apparently the public does not trouble much what it pays for the gems so long as it obtains them. Good business is, we understand, being done on the Continent in brilliants as well as in rough goods. As an illustration of the expansion of the diamond trade the following extract from an address delivered by Mr. E. F. Crowe, C.M.G., H.M. Commercial Counsellor of Embassy, Tokio, at the London Chamber of Commerce, on "Recent Developments in Japanese Trade," is worth noting: "The character of the trade will to a great extent change, and there will now be a good demand for commodities which formerly lay outside the ken of the Japanese. Take, as an example, diamonds, which form a good barometer of what one might call luxury trade. In 1915, according to the Customs returns, the imports amounted to £6,000. In 1918 the figures had jumped to £250,000, and just for the one month of March, 1919, the latest figures I have received, I note that the import was £35,000."

* * * *

Death of Mr. S. R. Jameson.

Mining circles on the Rand heard with profound regret this week of the death at Salisbury, Rhodesia, from heart failure, of Mr. Samuel Ross Jameson, formerly well known here. Deceased was a son of Mr. Samuel Jameson, who lived on the Rand in the early days, and a nephew of the late Sir Starr Jameson. For the past few years he was Sir Abe Bailey's representative in Rhodesia and consulting engineer to the various mines controlled by the Abe Bailey group. For many years he was manager of the Rezende Mines, and he was extremely popular in Salisbury and Umtali. He was 42 years of age, and leaves a widow and four children, to whom the greatest sympathy will be extended. Born at the Cape, he was educated at St. Andrew's College, Grahamstown, and thereafter underwent his mining studies at Camborne and the Royal School of Mines, London. He was resident for fifteen years in Rhodesia, and until joining Sir Abe Bailey was closely connected with the interests under the control of the late Sir George Farrar. He was President of the Salisbury Chamber of Mines and his passing is a distinct loss to Rhodesian mining.

* * * *

The World's Financial Centre.

Will New York become the world financial centre? asks Mr. A. Barton Hepburn, chairman of the Advisory Board of the Chase National Bank, in that institution's monthly magazine. He comes to the conclusion that although New York is undoubtedly the financial centre of America, it will have great difficulty in displacing London as the world financial centre. It requires something more than financial strength, tangible and latent resources, to constitute a financial centre. All this power must be supplemented by an ability to do a world business, which implies the understanding of the world's business, its wants, its wishes, its idiosyncrasies, its way of doing business. New York at present lacks that necessary experience. London also is most excellently equipped to do a world business and to be a financial and commercial centre. The ability to store goods in warehouses without payment of duty and to withdraw the same for export to any part of the world are important advantages which London has always enjoyed. Then, too, London is nearer the centre of the commercial population of the world. "England will be handicapped by its very great debt," he concludes, "and will lack the ability to furnish funds to finance all sorts of commercial enterprises the world over as it has done in the past. This ability to furnsh money and give credit is the most important leverage in securing foreign trade. In respect to capital, New York will enjoy a comparative advantage, and no doubt, as time goes by, will overtake and probably surpass London. I think that hereafter the business of the world, instead of concentrating, will find several financial centres. I look for Tokyo to become the financial and commercial centre of the Orient. Paris and Berlin will also be very important centres. In short, the effect of the war will be to decentralise financial power and distribute it in a greater degree throughout the leading commercial nations." It is early to prophesy, but the next few years will test the soundness of his opinion.

TOPICS OF THE WEEK.

NATIVE LABOUR QUESTIONS.

The happy ending to the great strike in England will doubtless have the effect of prolonging industrial peace in South Africa, and the result of the Conference to be held at Pretoria next month will, we hope, justify this view. The only serious cloud now on our horizon is the alleged dissatisfaction of the native workers, and it would be well to know to what, if any, extent this menace is removable, and by what means. The chief cause of native discontent, according to the native witnesses before the Low-Grade Mines Commission, is the rate of wages. They pointed out that the wages paid on the gold mines have increased only to a slight extent since 1914, but in reply the interim report of the Commission said that unless a sufficient number of unemployed natives were obtainable from present sources of supply, an increase in wages on the gold mines would merely divert natives from other industries. These would then increase their rates of pay, and, in the long run, although natives' wages had been increased all round, and the distribution of the natives amongst employers altered, the total number of natives employed by the industries of South Africa would not have increased appreciably, and an industrial crisis might result. The Commission went on to say that any substantial increase on the present native earnings, without a corresponding increase in the amount of their output of work, would merely be an additional burden to the low-grade mines and would be beyond their ability to grant. An increase of only threepence per shift to the native pay would represent £650,000 per annum on the basis of the number at present in service on the Witwatersrand mines. The whole native wage question, it may be recalled, was exhaustively dealt with by the Chamber of Mines in its evidence given before the Commission on Native Unrest last year. Briefly, that evidence showed that as the native on the mines was fed and housed, the only respect in which his personal cost of living can have increased is in clothing, and that the expenditure of the ordinary mine native on necessary clothing is small. "It is true that all natives buy a number of luxuries while working on the mines, and also take home with them various articles as presents to their relatives. While there is no doubt that the increased cost of such articles is a real grievance of the natives, it is surely wrong to argue that they suffer any *hardship* through being now unable to buy the same number of them at the same cost as before the war." In the light of these facts the Chamber was of opinion that so far as the personal cost of living of the natives employed on the mines was concerned, there had been no increase justifying an increase in wages. Having dealt with the absence of justification for an increased wage to mine natives through increase in the cost of living, the Chamber thus set out the industry's position as regards a demand for increased wages by whites or natives on general grounds, apart from the specific ground of increased cost of living:

> The Chamber in its discussions with the Trades Unions representing white employees has always adhered to the position that as the wages of white employees on the Witwatersrand compare most favourably with wages elsewhere in South Africa or indeed elsewhere in the world, it could not agree to any increase in the standard rate, although as already mentioned it was prepared to meet, as far as practicable, actual hardships produced by the increased cost of living due to the war. The same position applies as far as the natives are concerned since, when all the extraneous advantages which the native employees of the Gold Mining Industry enjoy are taken into consideration, it may be safely said that they receive higher wages than would be paid elsewhere in the country for work of a similar nature. It cannot therefore be argued by comparison with other wages that the mine natives as a whole are paid at rates which are other than ample, particularly when it is remembered that in contra distinction to those in the employ of most other employers a large number of the Industry's native employees are "green, raw boys from the kraals who do not even know the meaning of work." This number was estimated by the Departmental Committee on Underground Contracts at about 20 per cent. The very fact that the native mine labourer only spends about half of his time working in the mines (the other half being spent at home) shows that the margin in the wages paid to him as compared with the wages necessary for him to live, is very large.

Short of the removal of the colour bar, the only remedy appears to lie along the lines suggested by the Low-Grade Mines Commission in its interim report. That remedy, we may recall, was: "The existing Mining Regulations and the methods of working should be altered so that a larger proportion of the time spent underground by natives could be rendered available for work. Various methods of doing this have been proposed. . . . The resulting extension in the effective hours of work of the natives would help considerably to counterbalance the shortage in their numbers. It would also enable them to earn higher wages and thus, to some extent, remedy one of the primary causes of the discontent which their representatives have voiced before us. This, moreover, would be possible without in any way increasing the time spent underground by the natives." The report recommends that a conference be called to consider the necessary reforms in the mining regulations, and it is hoped that the suggestion will be acted upon without delay.

Good Hope Tin.

The revised prospectus of the Good Hope Tin Mines, Ltd., which is registered under the Companies Act of 1892 of the Cape Province, states that the capital is £50,000, divided into 100,000 shares of 10s. each. Issued to date, £24,000; now being issued to provide further equipment, development and general purposes of the company, £16,000; to reserve, to provide for future working capital if required, £10,000; total, £50,000. The directors are Messrs. John St. Leger, accountant, Capetown; W. S. Lane, merchant, Port Elizabeth; Jas. McGifford, merchant, Capetown. The company was formed and registered prior to the war with the object of opening up a tin lode found outcropping on the farm Hazendal, in the district of Stellenbosch, Cape Province, an agreement with the owners which granted an option to purchase, was taken over. This option has been exercised and arrangements made to take transfer of the property. The war having intervened, the work was not proceeded with until about two years after, when it was decided to proceed in a small way during the period of the war in order to prove the property; for this purpose those connected with the business provided sufficient capital to carry on the opening up and development of the lode. As the work proceeded the results obtained were beyond all expectations, and the richness of the lode opened up was so encouraging that it was decided to provide and erect a small roller reduction mill and concentration plant so as to enable the ore from development to be treated and the tin made marketable. This mill, although suiting the purpose of preparing the mineral for the market and thus proving conclusively the quality of the mineral, was not economical to run, and a more modern plant having been offered, it was decided later to purchase and erect the new mill, which consists of a No. 3 Gates' rock crusher, a 5-stamp battery (1,010lb. stamps), one jig, two Wilfley tables, two Frue vanners and one buddle, etc. . This plant has been substantially erected and is driven by a 60 h.p. suction gas power plant. Substantial mill buildings and native quarters have also been provided. A trial run of this plant treating unsorted ore from the mine gave the following results: Hours mill ran, 255; tons treated, 294; concentrates won, 6 long tons, equal to 2.04 per cent.; cost of milling, wages only, 7.32s. per ton. No attempt was made to treat the slimes, as the Frue vanners were not then completed. It is estimated that about 1 per cent. concentrates went into the slimes dump, which will be retreated and the tin recovered later. Altogether just over 26 tons of concentrates have been won to date and disposed of, obtaining the highest market price. These highly satisfactory results having been obtained, and the exceedingly good reports on the mine given by eminent mining engineers the directors feel that they can now with confidence proceed with the business on a much larger scale, and therefore have decided to take in additional capital, and have agreed to this issue of shares being placed at the original face value.

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NATAL'S COAL TRADE.

Growth of the Industry—How the Export and Bunkering Trade has Expanded—History of the Garden Colony's Coal Areas—The Colony's Outputs—Figures for Individual Mines.

[*By Our Special Commissioner in Natal.*]

In the past few years the Port of Natal—Durban—has enjoyed a steadily increasing measure of prosperity, and the general belief is that Durban is going to gain further in importance, as one of the leading towns washed by the Indian Ocean, rather than lose any of the ground which it has so far gained. During the war Durban's trade has risen very substantially, largely in consequence of the restrictions on the Suez Canal route to Europe. No small measure of this prosperity has been brought about by the development of the bunkering and export coal trade. Two hundred or two hundred and fifty miles from Durban are some of the most extensive and high-grade coalfields in Africa, and it is an indisputable fact that these areas are capable of producing an infinitely greater tonnage of coal than they have yielded so far. The present output is limited by truck shortage on the railways and also in a lesser degree by the supply of native labour available. Coal was first discovered in Natal so long ago as 1838, but for many years very little attention was paid to this asset of the country. [Probably the most valuable statement that has yet been made on the Natal coal industry is that submitted to the Dominions Royal Commission by Mr. J. Townley Williams, upon which we have drawn for much of the information in the following.] As to the extent of the Natal coalfields, there is an exhaustive report in existence, dated September, 1881, by F. W. North, an English mining engineer, and Fellow of the Geological Society. Mr. North was appointed by the late Natal Government to investigate and report on the coal measures of the Colony. He was engaged on the work for fifteen months, and finally estimated that Klip River County, Northern Natal, contained 2,073 million tons of coal, after deducting 50 per cent. for dykes, faults, etc. The report did not include the extensive coal-bearing areas of the new districts, Utrecht and Vryheid, which were added to Natal after the Boer War, nor does it include the coal and lignite deposits of Zululand. The lignite deposit in Zululand is extensive, but so far, nothing has been done with it. It was not, however, until 1889 that any serious attempt was made to develop the coal measures. At that time, a number of companies came into existence, of which only two, the Dundee Coal Company, and the Elandslaagte Coal Company, have survived. (The original field floated by the Dundee Company was exhausted some years ago.) Many of the remaining companies came to an end for various reasons, including the inexperience of the promoters, directors and managers. Ground was floated without adequate prospecting. Narrow seams were expected to yield a profit: inadequate working capital was provided; and this not wisely spent. In 1898, the serious strike of miners in the Welsh coalfield increased the price of coal produced elsewhere, and led Transvaal mining men to the Natal coalfields. Two of the companies they promoted—the Natal Navigation Collieries, and the Natal Marine Collieries—turned out successfully. The former is still in existence, but the latter was exhausted in 1903, after distributing in cash 20s. 6d. per share. The high prices for coal obtained during the Boer War led to further promotions, and increasing attention came to be paid to the Natal coalfields. During the Great War Durban came greatly to the fore as a coaling port, and to-day there is a demand for Natal coal which is greatly in excess of the supply. From Mr. North's estimate of 2,073 million tons, it would seem at first sight an easy matter to float any number of coal companies in Natal, but closer acquaintance with the nature of the coal deposits and of the geological characteristics of the district proved that the coal in some areas was not suitable for the best markets. A proportion is unsuitable because it is anthracitic, and cannot be used on the railways, nor by steamers trading with the Province, other areas are broken up, and in some parts the seams are thin. There still remain immense tonnages in existing properties and enormous areas of coal untouched by the prospector and promoter—an asset of great value to the future well-being of the Province and to the whole of South Africa. A few figures in regard to the expanding coal trade of Natal and of South Africa as a whole should here be of interest. In 1899 Natal's output was 28,700 tons, whilst in 1916 it was 3,366,202 tons, an increase of 33 per cent. over the previous year, and 80 per cent. over 1907. In 1916 the annual output of the whole of South Africa rose to over 10,000,000 tons. In 1906 the coal bunkered in Natal amounted to 846,000 tons, and in 1916 to 1,000,000 tons. In 1916 the whole South African output was 14 per cent. better than that of 1913, which was the next best year. In 1916 the tonnage of bunkering and cargo amounted to over 3,000,000 tons, or 500,000 tons more than in 1913. At Durban alone, in the year 1918, the coal bunkered amounted to 675,160 tons, and coal exported to 664,780 tons. The following figures are of considerable interest, inasmuch as they exhibit the outputs of Natal collieries for successive years since 1914:

Collieries.	1918. Tons.	1917. Tons.	1916. Tons.	1915. Tons.	1914. Tons.
Dundee (including Burnside and St. Georges)	336,528	369,914	412,510	320,830	379,373
Hlobane	331,055	410,276	411,060	310,842	253,845
Natal Navigation ...	266,801	304,743	369,394	290,001	318,240
Durban Navigation .	213,373	237,018	248,407	248,985	222,658
Tendega	145,503	119,323	18,365	—	—
Natal Cambrian	133,855	161,843	188,596	88,028	139,215
Wallsend (Natal) ...	125,234	139,082	97,151	55,010	25,176
Natal Steam	98,457	95,239	92,141	75,963	54,257
Utrecht	96,374	96,767	150,673	90,370	183,292
Glencoe (Natal) ...	86,385	140,593	186,758	153,065	168,883
Ballengeich	81,145	119,765	122,566	56,422	41,564
Northern Natal Navigation	72,706	102	—	—	—
Newcastle	71,322	80,663	80,619	51,346	58,211
Elandslaagte	64,891	65,948	67,409	53,550	148,257
South African (Bannockburn)	58,568	89,669	129,667	97,252	107,873
Natal Ammonium ...	43,942	24,840	13,112	10,450	1,165
Enyati	35,487	—	—	—	—
Bernica	33,393	3,948	—	—	—
Vryheid Coke Co. .	11,687	11,239	8,496	6,503	5,764
Dewar's Anthracite .	11,047	10,140	9,976	7,560	8,911
Avon	7,453	6,536	5,711	4,493	4,048
Hatting Spruit	3,146	67,274	101,739	108,544	114,465
Little Hlobane	557	—	—	—	—
Austin W. P.	384	622	462	-	-
Jas. Malcolm	177	—	—	-	—
Fairleigh	—	23,350	12,826	39,833	32,643
Ingagane	—	18	—	—	-
Standard	—	6	—	-	-
Ramsay	—	—	—	1,956	50,401
Makatees Kop	—	—	—	313	-
Kuwzmann	—	—	—	52	—
Star	—	—	—	—	-
Total	2,729,470	2,578,918	2,757,678	2,071,371	2,318,241

The increase in 1913 against 1912 was 136,173 tons; decrease in 1914 against 1913, 289,443 tons; decrease in 1915 against 1914, 246,870 tons; increase in 1916 against 1915, 686,307 tons; decrease in 1917 against 1916, 178,760 tons; decrease in 1918 against 1917, 249,448 tons, owing to war conditions and influenza epidemic.

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The output of Natal collieries for the first seven months of this year has been as follows:

		Total output from commencement to 31 7 19.
Natal Navigation Collieries	[illegible]	5,039,850

Total Output, All Collieries, January to July 31, 1919.

	Tons of 2,240lb.	Tons of 2,240lb.
Northern N. Navigation Collieries	61.419	134.227
Glencoe	56 619	2,321,724
Avon	5.587	36,838
Ballengeich	[illegible]	787.667
Dundee Coal Co.	[illegible]	6,980.007*
Dewar's Anthracite ..	[illegible]	[illegible]
Durban Navigation	122.422	3,171,161
Elandslaagte	29.292	2 962 649
Hlobane	185.561	2.771,341
Natal Cambrian	58.426	1.826.419
Natal Steam	[illegible]	1.050.621
Newcastle	[illegible]	1.296.504
S.A.C.	55.775	1,638,831
Vryheid Coke Co.	6,429	[illegible]
Utrecht	61.999	1,280,217
Wallsend	53,045	528.817
Natal Ammonium	26.900	120.409
Tendega	69,517	352.708
Enyati	103.039	138.526
Berniea	15,533	52.874
Jas. Malcolm	47	47
Little Hlobane	132	689
Nyembe		—
Buffalo	19.469	19,469
Total	1,420.911	

*Includes St. George's Colliery, Burnside Colliery and Old Dundee Colliery since commencement.

Natal Coal Trade Notes.

The coal output of the Natal Navigation Company for the month of September was approximately 20,000 tons; that of the Northern Natal Navigation Collieries about 11,000, and of the Glencoe Company between 8,000 and 9,000 tons.

The Natal Navigation Company is opening up a new coal area in close proximity to the existing mine.

The Northern Natal Navigation Colliery is opening up as a very successful enterprise. The mine is situated at Dumbe Station, and the Company possesses exceptional facilities for cheap working. In addition to its present undertaking, the company possesses a valuable coal area at Makatee's Kop.

The Dundee Coal Company is about to commence the erection of an important by-product plant.

The coaling position of the Port of Durban may be best gauged by the statement that, on October 2nd, some 46,000 tons were required to meet the demand, and with a limited quantity on hand, shipping is still likely to be delayed for a considerable time.

The Price of Silver.

The price of silver is still mounting, and on September 25 bar silver was quoted at 63d. an ounce, which is the highest on record. The principal causes of this remarkable rise are the decrease of production—(for example, the Mexican output is now less than half of what it was at one time)—also the extraordinary demand from India, China and other Eastern countries. It is understood that 600,000 sterling of the last consignment of gold was shipped to India. This operation is regarded with particular interest, as it is understood that the Indian Government is endeavouring to economise the circulation of rupees by the sale of gold in India.

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ANOTHER SUCCESSFUL YEAR AT THE NEW MODDER.

Big Increase in Profits Due to New Reduction Plant—Share Splitting Scheme—The Question of Enemy Holdings—Inadequate Native Labour Supply.

The annual report of the New Modder has now been issued. As anticipated in last year's report, the new main winding plant was completed and came into service in October, 1918, which, with the coming into operation of the new reduction plant, resulted in an increase for the year of 236,400 tons in the tonnage milled and an increase in the working profit of £256,627 10s. 10d. The supply of native labour has not been sufficient for the mine to provide the necessary tonnage to enable the reduction plants to be used to their full capacity. This shortage has not only had its effect on the profits but has also resulted in development operations being conducted on a very moderate scale, the tonnage developed for the year was 723,600 tons; this was not quite sufficient to maintain the ore reserves, which at the end of the year amounted to 8,854,300 tons valued at 8·5 dwts. over 66 inches. Compared with the previous year this is a decrease of 145,700 tons in the tonnage and ·1 dwt. in value. The directors add that, "Given an adequate native labour force, both the tonnage milled and profit could be considerably increased." The working profit for the year amounted to £1,089,891 6s. 7d., to which has been added £12,068 12s. 4d., being the difference between sundry items of revenue and expenditure enumerated in the working expenditure and revenue account, making a total of £1,101,959 18s. 11d., which has been carried to appropriation account. This amount, together with the balance of £306,743 13s. unappropriated at the commencement of the year, and £218 18s. 4d. in respect of forfeited dividends, making a total of £1,408,922 10s. 3d., has been dealt with as follows:—Capital expenditure: Equipment, £53,860 7s. 11d.; annuity in respect of undermining rights leased from Government, £17,310; total, £71,170 7s. 11d.,; less owner's share of Bewaarplaats moneys, £7,789 10s.—£63,380 17s. 11d.; Government taxes, £143,911 19s.; Provincial (Transvaal) tax, £70,762 14s. 4d.; dividends Nos. 25 and 26, £875,000; total £1,153,055 11s. 3d.; leaving an unappropriated balance of £255,866 19s. This balance is made up as follows: Shares in co-operative concerns, £7,408 19s. 6d.; stores and materials, etc., £142,940 15s. 2d.; sundry debtors and payments in advance, £12,165 16s. 9d.; Rand Mines Power Supply Co., Ltd. (compressor account), £52,287 0s. 11d.; total, £214,802 12s. 4d.; cash on hand, and investments after allowing for liabilities, £41,064 6s. 8d.; total £255,866 19s. The directors state that the British Treasury having recently removed the restrictions on the splitting of this company's shares, the directors have decided to convene extraordinary general meetings for the 9th December, 1919, and the 31st December, 1919, for the purpose of considering a proposal to sub-divide the present £4 shares into eight shares of the nominal value of 10s. each, this denomination having been decided upon in deference to the desire of a large number of shareholders. Circulars and notices in this connection are being forwarded to shareholders under separate cover. The arrangements for the disposal of gold during the war period having come to an end, the necessary facilities for a free market in gold have now been obtained, and it is hoped that this will result, at any rate for a time, in an increased price being realised. Negotiations were carried on for some time with the Government of the Union of South Africa for the purchase by this company of the enemy owned shares in the company vested in the Custodian of Enemy Property. Had these shares been acquired they would have been offered at the purchase price to the shareholders of the company, who are not subjects of any State recently at war with Great Britain, *pro rata* to their shareholding. Unfortunately, it proved impossible to arrive at a mutually satisfactory price, and negotiations with the Government had to be suspended. At the moment it is uncertain if the Government is in a position to deal with these shares in this manner, but if an opportunity offers negotiations for their purchase will at once be resumed.

Consulting Engineer's Report.

In the absence of Mr. H. Stuart Martin, on leave, Mr. H. Meyer endorses the report of the manager, Mr. E. Miles Sharp, on the operations of the company for the year ended June 30th, 1919, and adds:—Owing to the new reduction plant coming into operation, a further improvement in working profit was realised, viz., a total of £1,089,891, or

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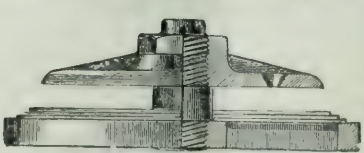

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an increase of £256,628 compared with the preceding year. The comparative figures for the last three years are as follows:— Tons milled, 1917 656,700, 1918 681,100, 1919 920,500; yield per ton milled, 1917 43s. 4d., 1918 45s. 7d., 1919 43s. 10d.; working costs per ton milled, 1917 19s. 5d., 1918 21s. 3d., 1919 20s. 2d.; working profit per ton milled, 1917 23s. 11d., 1918 24s. 4d., 1919 23s. 8d.; working profit, 1917 £785,017, 1918 £833,263, 1919 £1,089,891; ore reserve (tons), 1917 8,914,400, 1918 9,000,000, 1919 8,854,300; ore reserve (value, dwts.), 1917 8·5, 1918 8·6, 1919 8·5. The new hoisting plant was completed and came into successful operation in October, 1918. Its capacity is ample to keep the reduction plant fully supplied, but as the number of natives procurable has never yet been sufficient to handle the quantity of ore that can be dealt with by the plant, there has been no real opportunity of loading the new equipment to its true capacity. The tonnage milled for the year has varied from 70,000 to 88,000 tons monthly, the yield from 41s. 8·2d. to 46s. 3·7d., and working costs from 19s. 1·4d. to 21s. 3·1d. per ton milled, whilst the profit has averaged £90,824 per month. The yield obtained, though lower than for the preceding year, was nevertheless somewhat higher than called for by the average value of the ore reserve. It will be clear from the above that there still remains a considerable margin of output and profit, which can only be secured by an increased supply of native labour. The average number of natives employed for the year was 4,460, the rated complement being about 6,000. In view of the strength of the ore reserve and the continued shortage of labour, development operations were conducted on a very moderate scale, the tonnage developed being 723,600 tons of an estimated value of 8·8 dwts. As a consequence, the ore reserve was not quite maintained, the position disclosed on the revaluation at June 30th, 1919, showing a reserve of 8,854,300 tons valued at 8·5 dwts. over 66 inches, inclusive of 408,900 tons valued at 7·1 dwts., consisting of shaft and boundary pillars. Development operations disclosed no features of special importance. Capital expenditure totalled £53,860, of which the greater part was spent in the first six months of the year on the programme of expansion. The commitments on this account for the current year are moderate. The mine is in first-class condition and capable of materially increasing both output and profit with an increased labour supply. The management and staff are to be congratulated on the successful results of the year's work.

MANAGER'S REPORT.

Mr Miles Sharp writes, *inter alia*:— The operations for the year under review constitute a further record in the history of the mine. The profit was £1,089,891—an increase of £256,628—and the yield per ton was 1s. 9d. lower, while working costs show the appreciable reduction of 1s. 1d. per ton. The new reduction plant has been in operation throughout the year and has given satisfaction. The winder at the circular shaft was completed in October, 1918, and is capable of dealing with the full tonnage that can be obtained with an adequate labour supply. One 65-drill electrically driven compressor was erected at the circular shaft: owing to the non-delivery of a third compressor of the same type two steam-driven compressors of 30 and 35-drill capacity have been installed as a temporary measure. The sorting station at the west plant was thoroughly overhauled. During the year no trouble or expense has been spared in improving ventilation and underground conditions, and it is satisfactory to be able to record that there is a diminution in the quantity of dust and that there is an adequate supply of air at all faces. The machinery and plant have been maintained in good order. Native labour: The labour supply was irregular and below the requirements of the mine. In November there was a serious outbreak of epidemic influenza; fortunately the disease was of a mild type, but the efficiency of the labour force was impaired and was reflected in the results for December.

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THE PROSPECTS OF THE SUB NIGEL.

Detailed Review by Mr. C. D. Leslie of the Development Position.

During the year ended June 30 the profits of the Sub Nigel, after allowing for the expenditure of £6,231 8s. 1d. on renewals and replacements of machinery, plant, etc., amounted to £82,103 11s. 6d.; add interest, sundry revenue, etc., £1,076 10s. 4d.; making a gross profit of £83,180 1s. 10d.; less provision for South African income tax, special expenditure due to war, sundry amounts written off (including depreciation on investments), levies under Miners' Phthisis Act, expenditure in connection with increase of capital, £20,948 12s. 8d.; leaving a nett profit carried to appropriation account of £62,231 9s. 2d. The balance at credit of appropriation account at June, 1918, was £5,821 12s. 4d.; making a total of £68,053 1s. 6d.; out of which there has been appropriated for dividend No. 12 of 5 per cent. on 475,000 fully paid shares of £1 each and on 300,000 partly paid shares (5s. called up), and for dividend No. 13 of 5 per cent. on 475,000 fully paid shares of £1 each, and on 300,000 partly paid shares (10s. called up) declared during the year, £58,750; leaving a credit balance to appropriation account at 30th June, 1919, of £9,303 1s. 6d. The amount of working capital unexpended on capital account at 30th June, 1919, was £66,855 15s. 3d. The expenditure on shaft sinking and equipment of property for the year amounted to £79,619 14s. 6d.

Consulting Engineer's Report.

In his report on the operations on the company's property during the year ended 30th June, 1919, Mr. C. D. Leslie writes: "The tonnage milled was approximately the same as during the previous year and there was an improvement in average recovery of 3s. 9·755d. per ton milled. Working costs, however, were increased by 5s. 6·123d. per ton milled, so that the profit on working was reduced by £9,655 9s. 6d., or 1s. 8·358d. per ton milled. The increased amount of development coupled with a higher cost per foot added an additional 1s. 6·822d. per ton to the working costs. The improved grade was largely a result of drawing a high proportion of the tonnage from the rich and easily accessible chutes adjacent to 'C' incline shaft. Failure in the replacement of this tonnage by ore equally rich and accessible would be expected to re-act unfavourably on profits. The ore reserve fully developed at 30th June, 1919, is estimated at 342,000 mine tons of an average value of 10·3 dwts. per ton in addition to which there is partially developed ore, estimated at 59,000 mine tons of an indicated value of 10·1 dwts. per ton. As compared with the previous year the fully developed tonnage is lower by 45,000 mine tons, the value remaining unchanged, whilst the partially developed ore is higher by 23,000 tons, the grade of which shows a slight improvement. 'B' Shaft Section: The 16th level drive east encountered a new pay chute which was advanced on for a distance of 355 feet, averaging 11·0 dwts. per ton over a stoping width of 42 inches. 'C' Shaft Section: The rich chutes met with on the 16th level are now fairly definitely known to extend to the horizon of the 18th level. 'D' Shaft Section: Development disclosures for the year have been irregular and disappointing and the area is broken up by dykes, the effect of which is, as yet, unknown. This section is the one nearest the new vertical shaft which is expected to intersect the reef before the end of the year, and the occurrence of these dykes together with the erratic development disclosures in their neighbourhood, are viewed with anxiety. 'E' Shaft Section: In the limited amount of development done here the values of reef exposed have been irregular, but an improvement is expected as development advances. It is disappointing to find that, largely through the troubles encountered in 'D' and 'E' shafts as referred to, the extensive development footage accomplished during the year had not the effect of increasing the ore reserve which must be added to very materially before the question of extended plant capacity can be definitely settled. The prospect of sufficiently increasing the ore reserve in the near future, by extending development as at present in the eastern area only, is not promising, particularly since the rate of development and output per employee is less than it used to be, thereby necessitating the provision for greater development and a larger number of stope faces than would have been required for the same output under former conditions. Therefore it is to be feared that the programme for expansion will have to be detrimentally modified if the large dormant western area of the mine continues to be neglected. The only development in this western area during the year under review was in a winze, now stopped, which was advanced at right angles to the direction of the long axes of the known pay chutes of the Nigel district. The winze intersected a pay chute of an average reef width of 37½ inches and an average value of 8·3 dwts. per ton. This winze was advanced a further distance of only 25 feet which exposed reef 16·8 inches in width, having an average value of 8·6 dwts. per ton. This last distance of 25 feet may be representative of the lower grade stretches which characterize the pay chutes of the mine. It would be quite unreasonable to expect that the pay chutes do not occur westwards in this large unexploited area. In comparing, one with another, the average width of pay chutes, it was found that there is a persistent widening of reef from east to west throughout the mine. This marked feature, which is confirmed by the exceptional reef width of the pay chute in the western winze referred to, has a favourable bearing on the prospects of the large and, in my opinion, promising western area of the mine. The importance of this information should not be disregarded, especially in view of the most urgent need of finding new places of attack for the purpose of augmenting the ore reserve. I desire to record my appreciation of the services rendered by the manager and the members of his staff during the year, which has been a very difficult and trying one."

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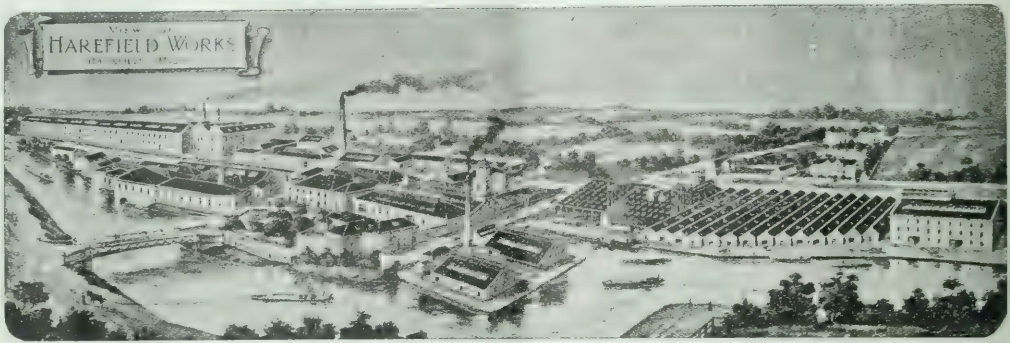

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THE OUTLOOK FOR THE ROOIBERG TIN MINE.

At Rooiberg in the year ending June 30 last, the total tonnage of ore milled was 15,229 short tons, and in addition, 11,190 short tons of stock slime and sand were re-treated. 350 long tons of concentrates of an average assay value of 65·85 per cent. were produced containing 230·5 long tons of metallic tin. These figures include 5,309 tons milled from Blaauwbank, yielding 81·75 long tons of concentrates, of an average assay value of 67·2 per cent., containing 54·98 long tons of metallic tin. Owing to the absence of any large body of ore in the mine from which to draw the bulk of the requirements for the mill, it was found impossible to keep the reduction plant working to its full capacity, and the mill was, therefore, closed down in the beginning of May. The work on development and exploration has not been restricted, and although no discoveries have been made that have yielded any large ore bodies, good grade ore has been met with in a number of places. Ore will be stacked until the accumulation is sufficient to justify the resumption of milling operations. At the close of the year 2,350 short tons of ore were stacked ready for treatment. Alluvial sluicing operations resulted in the recovery of 7·36 long tons of metallic tin during the year. The revenue derived from the realisation of tin concentrates amounted to £53,961. A further £726 was received for interest, etc., making the total revenue £54,687. The working expenditure was £70,178. In addition £1,771 was expended on the purchase of a Shot drill, a Deister rougher, and on the completion of certain additions to the slimes plant, commenced in the previous year, and £286 was paid in connection with the acquisition of the mineral rights of the farm "Blaauwbank," in terms of the agreement made. The appropriation account at the beginning of the year had a balance of £25,621. After providing for the deficit of the year, viz., £17,548, the balance of £8,073 has been carried forward. The amount standing to the credit of the reserve fund remains at £21,450. All expenditure upon development, exploration and alluvial sluicing, amounting to £22,552, has been charged to working costs. The average price of metallic tin, on which the sales of concentrates for the year were effected, was £242 10s. per ton, as compared with an average of £262 for the previous year.

Manager's Report.

In his report on the operations of the company for the year ended 30th June, 1919, the manager, Mr. M. Baumann, writes, *inter alia*:—Main shafts: No. 6 shaft was sunk to a depth of 206 feet. No. 5: A strong inflow of water was encountered on the 4th level, and, as development was disappointing, it was decided to discontinue work and allow the shaft to fill. Development: The total footage driven, risen and sunk, exclusive of shaft-sinking, was 3,334 feet. No discoveries have been made which yielded any tonnage that may be looked upon as ore reserves. Prospecting: Rooiberg: The total footage driven, risen and sunk was 523 feet, and in addition 3,904 feet of trenching of an average of 5·2 feet, was done; no finds of any importance resulted. Blaauwbank: 2,724 lineal feet of trenching of an average width of 6·6 feet and depth of 4·4 feet was done. Though the presence of tin was indicated in several places, the values were not such as to warrant extensive development, except in one area—the main workings—situated close to the eastern boundary of the farm, where good values were found at 176 feet from the outcrop. The continuance of the lode is being tested by means of a Shot drill. The total footage driven, risen and sunk for the year on this farm was 1,189 feet. From the time operations started at Blaauwbank 7,433 tons of ore have been milled of a grade of 1·40 per cent. M.T. Alluvial sluicing: 19,557 tons of sand were washed during the year, from which 7·36 long tons of M.T. were recovered. Influenza epidemic: During the epidemic work was considerably interfered with. Of the native complement of 601 boys, 580 were treated in hospital during October and November. The death rate, fortunately, was very low. General: Owing to the fact that sufficient rock could not be broken to keep the mill working at full capacity, it was decided that the mill should be shut down from the beginning of May, and since then slime and sand only have been treated, and economies have been effected wherever possible. In the meantime development and prospecting have been actively pursued, and ore is being accumulated on the surface preparatory to a resumption of milling.

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THE SEPTEMBER GOLD OUTPUT: GROUP RETURNS.

Central Mining/Rand Mines Group.

The following are the results of crushing operations of the Central Mining/Rand Mines companies for the month of September:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Total Fine Ozs.	Total Estimated Profit.	Estimated Working Costs per Ton.
City Deep	A154	10	57,000	25,170	£28,682	27/ 0
Cons. Main Reef	220	6	45,100	17,175	9,005	28/ 1
Crown Mines ...	660	26	176,000	58,242	57,012	21/ 3
Dur. Rood. Dp..	100	3	20,400	6,615	*4,611	31/ 9
East Rand Prop.	440	19	126,000	35,405	13,337	21/ 6
Ferreira Deep ...	160	7	32,500	11,442	8,001	24/ 7
Geldenhuis Deep	300	7	42,900	12,160	*704	24/ 2
Knight Central .	120	3	20,000	5,968	*5,001	30/ 1
Modder B. ...	B104	8	55,500	27,574	54,003	22/ 2
New Modder ...	C236	15	67,500	36,153	78,390	22/ 3
Nourse Mines ...	180	5	37,250	11,310	*4,139	27/ 9
Robinson	210	6	40,700	9,915	2,503	19/ 2
Rose Deep	300	7	50,900	13,856	10,949	18/ 6
Village Main Rf.	130	4	17,200	5,879	1,233	27/ 3
Wolhuter	120	4	27,200	8,471	2,603	24/ 3
Village Deep ...	180	7	43,600	14,699	181	28/ 2
Tls. & Averages	3,614	137	859,750	300,034	£251,444	23/ 6

A Includes 4 Nissen stamps. B Includes 24 Nissen stamps.
C Includes 56 Nissen stamps.

* Loss.

General.—The published results do not include the increased price now being obtained under the new arrangement for the free disposal of the gold shipped since 25th July last. The gold so far sold is equal to slightly under one month's output of the Witwatersrand and has realised a premium of approximately 16 per cent. Any increased profits obtained by the companies will be published quarterly after receipt of account sales. The supply of native labour continues to be very unsatisfactory and is responsible generally for the decreases in tonnage milled.

The following note applies specially to the undermentioned companies: Geldenhuis Deep, Ltd., Nourse Mines, Ltd., Durban Roodepoort Deep, Ltd., Knight Central, Ltd. —Loss mainly due to extreme shortage of native labour, which resulted in small tonnage treated at consequent high cost.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of September of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs	Total Profit
Simmer and Jack ...	320	7	52,600	14,085	£5,527
Robinson Deep	160	9	54,200	18,226	9,509
Knights Deep ...	400	11	86,400	16,855	616
Simmer Deep	220	10	49,000	12,235	*377
Jupiter	80	5	25,000	6,429	*1,582
Sub Nigel	30	2	9,900	6,221	6,384
Totals	1,210	44	277,100	74,051	£20,077

Gold in reserve.— Simmer and Jack, 1,125 ozs.; Robinson Deep, 1,810 ozs.; Sub Nigel, 3,090 ozs.; total, 6,025 ozs

The published results do not include the increased price now being obtained under the new arrangement for the free disposal of the gold shipped since 25th July last. The gold so far sold is equal to slightly under one month's output of the Witwatersrand and has realised a premium of approximately 16 per cent. Any increased profits obtained by the companies will be published quarterly after receipt of account sales.

Union Corporation.

Results of operations on the producing mines of this group for the month of September:—

Company	Stamps.	Tons Crushed.	Total Revenue.	Revenue per ton.
Geduld Proprietary	100	42,500	£65,119	30/ 8
Modder Deep Levels ...	70	42,500	94,746	44/ 7
Princess Estate . .	60	20,000	26,470	26/ 5
Totals	230	105,000	£186,335	—

Company.	Costs.		Profit.	
	Total.	Per Ton.	Total.	Per Ton
Geduld Proprietary ...	£44,525	21/ 0	£20,594	9/ 8
Modder Deep Levels ...	39,951	18/10	54,795	25/ 9
Princess Estate	28,456	28/ 5	*1,986	2/ 0
Totals	£112,932	—	£73,403	—

* Loss.

Note.—The published results do not include the increased price now being obtained under the new arrangement for the free disposal of the gold shipped since 25th July last. The gold so far sold is equal to slightly under one month's output of the Witwatersrand and has realised a premium of approximately 16 per cent. Any increased profits obtained by the companies will be published quarterly after the receipt of account sales.

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A study of the values arrived at and of the gold and profits estimated will enable investors to judge on sound data what they are doing.

All interested in the mines of the Far East Rand should lose no time in ordering the book through their Booksellers. It may repay itself a thousandfold.

If any difficulty is found in obtaining the book, orders can be sent to the Author at 3 Transvaal Bank Buildings, Fox Street, Johannesburg, or to the offices of this Journal.

Albu Group.

The following information is supplied regarding the September operations of the producing mines of the General Mining group:—

Company	Tons Crushed.	Cost.	Cost per Ton.	Total Revenue.	Profit.
Aurora West ...	13,700	£16,596	24·23	£15,104	£1,492
Meyer & Charl.	14,442	16,846	23·33	40,351	23,505
New Goch ...	13,800	13,959	20·23	11,883	*2,076
Roodepoort Un.	23,100	24,651	21·34	23,490	*1,161
Van Ryn Est...	30,700	28,719	18·71	32,768	4,049
West Rand Cn.	30,400	37,562	24·71	38,598	1,036
	126,142	£138,333	21·93	£162,194	£28,590
				Less Losses	£4,729
					£23,861

* Loss.

The above results do not take into account the increased price now being obtained for gold, which, according to advices so far received from London, represents a premium of approximately 16 per cent. on the standard figure. Extreme shortage of native labour affected the operations of all the mines of the group except the Meyer and Charlton.

Consolidated Mines Selection Group.

The following are the results of operations for the month of September, 1919:—

	Stamps Working.	Tons Milled.	Working Costs per Ton Milled
Brakpan Mines	110	41,500	28/ 5·585
Springs Mines .	80	36,550	29/ 1·289
Totals and averages .	190	78,050	28/ 9·194

	Value of Gold declared.	Yield per Ton.	Working Profit.	Working Profit per Ton.
Brakpan Mines ...	£81,205	39/ 1·620	£22,139	10/ 8·035
Springs Mines . .	71,689	39/ 2·736	18,495	10/ 1·447
Totals & averages	£152,894	39/ 2·142	£40,634	10/ 4·948

Brakpan.—Taken from gold reserve, 1,000 fine ozs.; balance reserve at date, 6,724 fine ozs.

The reduction in tonnage crushed is due to an acute shortage of native labour.

The published results do not include the increased price now being obtained under the new arrangement for disposal of the gold shipped since July 25 last. The gold so far sold has realised a premium of approximately 16 per cent. The increased profits obtained by the companies will be published quarterly after receipt of account sales.

Transvaal G.M. Estates.

The following are the particulars of this company's output for the month of September, 1919: Central Mines: Tons crushed, 12,000, yielding 4,302 fine ozs. Elandsdrift Mine: Tons crushed, 1,310, yielding 784 fine ozs. Vaalhoek Mine: Tons crushed, 1,900, yielding 564 fine ozs. Estimated value of month's output, £23,636; estimated profit for the month, £3,213.

Glynn's Lydenburg.

The following are the particulars of this company's output for the month of September, 1919: Tons crushed, 2,770, yielding 1,106 fine ozs.; estimated value of month's output, £4,617; estimated loss for the month, £17. The published results do not include the increased price now being obtained under the new arrangement for the free disposal of gold shipped since July 25 last. The gold so far sold is equal to slightly under one month's output of the Witwatersrand, and has realised a premium of approximately 16 per cent. Any increased profits obtained by the companies will be published quarterly after receipt of account sales.

Barnato Group.

The results of operations of the Barnato group for September are as follow:—

Mine.	Stamps.	Tons Crushed.	Revenue from Gold
Consolidated Langlaagte ...	100	43,000	£53,720
Government Areas ...	180	113,000	201,740
Langlaagte Estate	200	40,200	48,775
New Primrose	100	17,100	17,132
New Unified	60	11,300	11,673
Randfontein Central	600	150,000	174,378
Van Ryn Deep	90	50,500	110,483
Witwatersrand ...	215	32,650	37,733
Totals and averages ...	1545	457,750	£655,634
August totals ..	1545	440,410	£649,944

Mine.	Total Working Costs.	Working Costs per Ton Milled. Shillings.	Gross Profit including Sundry Revenue.
Consolidated Langlaagte ..	£43,770	20·358	£10,113
Government Areas	118,530	20·979	83,776
Langlaagte Estate ...	43,119	21·452	5,821
New Primrose	15,623	18·272	1,589
New Unified	10,248	18·138	1,456
Randfontein Central .	164,110	21·881	11,242
Van Ryn Deep	52,012	20·599	59,023
Witwatersrand	36,166	22·154	3,028
Totals and averages ...	£483,578	21·128	£176,048
August totals	£483,660	21·964	£170,255

Monthly Gross Profit, 1919.—January, £162,943; February, £154,054; March, £179,310; April, £180,785; May, £190,416; June, £184,687; July, £194,398; August, £170,255; September, £176,048.

Miners' Phthisis Assessment under new Act, included in working costs per ton milled: Consolidated Langlaagte, 8·642d.; Government Areas, 3·934d.; Langlaagte Estate, 7·102d.; New Primrose, 5·347d.; New Unified, 5·436d.; Randfontein Central, 7·345d.; Van Ryn Deep, 11·207d.; Witwatersrand, 7·304d.

Note.—These results do not include the increased price now being obtained under the new arrangement for the free disposal of the gold shipped since 25th July last. The gold so far sold is equal to slightly under one month's output of the Witwatersrand and has realised a premium of approximately 16 per cent. Any increased profits obtained by the companies will be published quarterly after receipt of account sales.

Leeuwpoort Tin.

The following is the official report of operations for the quarter ended September 30:—Stamps, 17 (including 2 Nissen); time run, 81·81 days; tons crushed, 14,221 short tons; concentrates won, 233 long tons. Average assay value of concentrates is 61·95 per cent. metallic tin. Average price of metallic tin on which the quarter's revenue has been determined is £256 17s. 9d. per ton. Estimated profit, £7,124 14s. 9d. Capital expenditure: The sum of £4,312 11s. 2d. has been expended for machinery, buildings, shaft sinking, etc. During the quarter the sum of £2,844 4s. for development redemption was included in working costs.

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A REVIEW OF THE MINING INDUSTRY.—V.

Points from the Report of the Secretary for Mines and Industries for 1918.

In the course of his annual report for 1918 the Secretary for Mines writes:—

Juvenile Advisory Boards.—The establishment of Juvenile Advisory Boards at Durban, Johannesburg, and Capetown having proved of very direct benefit to both juveniles and their parents, it was only to be expected that other centres would move in a similar direction. During the year, Boards were formed at Pretoria and Bloemfontein. Other applications are anticipated and so important has this branch of the work become that it has been found necessary to detail a member of the staff for duty as organizing secretary for Juvenile Advisory Boards. The work undertaken by these Boards embraces every aspect of the question of juvenile welfare. The Boards are constituted of representative citizens from all branches of society and from all interests, and the work they have done and are doing is most valuable, both in educating the public to the intimate relationship between education and industry and the need that each has of the other, as well as in the more direct and practical help they give to parents and children in the urgent problems of seeking a livelihood. Records are kept of each child about to leave school and communication is established with the children and parents. As a result of the information gained, advice is offered as to the children's future. Boards keep in touch with employers and ascertain vacancies in, and the requirements of, the different industries. The names of suitable candidates are selected from the records and submitted to the employers with a view to filling the vacancies. Interest in a child does not cease with the placing of that child in employment but continues throughout the period of adolescence. The boy or girl's career is watched, advice is tendered, but where difficulties arise, assistance is rendered to remove them. In fact the efforts of the Boards are directed towards the efficient education and treatment of young people by placing them in useful employment, and towards the establishment of a comprehensive system of national training. These efforts will be to a large extent wasted, however, if we cannot extend our industrial activities and utilize and develop our resources and so broaden the whole basis upon which the fabric of State depends. For a large number of the children leaving school every year, it is becoming increasingly difficult to find useful employment in the Union. It is a matter of the most serious difficulty to-day to apprentice a lad to any skilled trade. All the professions are overcrowded. Even in unskilled work we have far too few avenues of employment suitable for whites. A hundren thousand white people are not earning their keep, while a large number are living on the margin of bare existence. Emergency and relief works, doles, and legislation are not the solution. Only increased production by the utilization to the utmost of the resources with which the country is blessed can bring salvation from the serious problem of what to do with our rising white population. The more ambitious and better educated of our boys are already looking to other countries for the opportunities which are too scarce in South Africa. We can only prevent the loss of the best of our youth in the future and the deflection of many into the barren paths followed by the speculator, the gambler, and the illicit dealer by the active development of our resources and the winning of fresh markets for our products.

Wages Boards.—The Regulation of Wages, Apprentices, and Improvers Act (No. 29 of 1918) was brought into operation during the year under review and advantage taken of its provisions by many centres to apply for wages boards. Boards were sanctioned for Johannesburg and Durban before the close of the year. It is anticipated that in the near future a number of boards will fix minimum rates of wages for women and young persons engaged in the trades or occupations specified in the schedule to the Act. Signs are not wanting of urgent demand for the extension of the principle of these boards to all workers in trades and industries generally.

Labour Advisory Boards.—During the year the work of establishing Labour Advisory Boards in all the magisterial districts of the Transvaal was continued. Most of the boards are now in operation, their functions being to advise the Department in regard to all matters affecting labour and especially farm labour in their districts. Special attention is paid to the question of placing European workers on the

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land, and every effort is made to foster the substitution of white for coloured labour wherever this is economically possible.

Unskilled White Labour.—The problem of the employment of surplus poor white labour far from being solved is growing more acute daily. 87 per cent. of the white labour employed on the mines is recruited from the Dutch-speaking community. But for such employment it can safely be stated that the bulk of these would have become poor whites. A fair proportion have been able to save sufficient to enable them to return to their original spheres of activity, viz., agriculture; others having been placed once more on their feet have acquired various businesses. Two afforestation settlements in the Cape Province and two irrigation projects in the north are now being worked by unskilled white labour, while a further afforestation settlement for returned soldiers has been sanctioned at Hankey. These should employ between 500 and 700 men, all told, and their development and results will be watched with interest. The railways, too, afford a large field for further employment of unskilled whites. The process of effecting the change from coloured to white labour is a slow one for various reasons. 4,574 white labourers are employed on the railways. Up to date, 4,817 have received promotion (this covers the period 1907-1919). Those in employ to-day possess an aggregate of over 9,000 head of cattle and sheep. The constant stream to the towns of men unsuited to urban conditions is to a considerable extent guarded against in the Transvaal by the Labour Advisory Boards, which also are a useful medium for placing suitable men on farms, for keeping in touch with farm labour conditions, attending to the welfare of children leaving school in the country districts, etc. Bloemfontein is setting an example to municipalities in its housing scheme for poor whites whereby it will be possible for the bulk eventually to own their own small properties. The state of affairs in the town was becoming deplorable—slum areas with the attendant vices were growing, but the scheme promises to be an object lesson of real value. Houses and their inmates will be under municipal supervision. Unfortunately the good work being done here is becoming widely known, with the result that large numbers are flocking to that town as they regard it as "'n goeie plek vir arme mense." The Department is doing all it can to curb this influx. In certain districts of the Union indigency is more acute than in others and for those living in the former every effort is made to find employment in other districts and Provinces. Where it can be clearly shown that farm work awaits an applicant for a rail warrant this is given gratis by the Department, provided the applicant is a suitable man for such work and the employer is one to whom white labour can be trusted.

(To be continued.)

Mine Ambulance Contests.

The seventh annual competition for the Underground Workers' Shield presented by the Chemical, Metallurgical and Mining Society of South Africa, with cash and medals awarded by the Rand Mutual Assurance Co., Ltd., and this Society, will be held (by kind permission of the directors and general manager) at the Ferreira Deep, Ltd., on Sunday next, the 12th inst., commencing at 9 a.m. The property is situated on the Booysens Road, and Booysens and Turffontein trams pass close to the spot, which will be marked by a red cross flag. Trams leave the Market Square (near Chamber of Mines) every few minutes, and visitors should alight at the stopping place near Fraser & Chalmers' yard. The following teams (which will draw for competition order on arrival) have qualified in the district competitions to enter for this competition:—Krugersdorp: Consolidated Main Reef Mines; Johannesburg, Crown Mines, Ltd., and Wolhuter G.M., Ltd; Germiston, Geldenhuis Deep, Ltd.; Boksburg, East Rand Proprietary Mines, Ltd.

GEDULD PROGRESS.

New Vertical Shaft Begun Last March

THE WEEK IN THE SHAREMARKET.

Sharp Recovery on Strike Settlement—Some Notable Advances—Activity in Far East Shares.

The market opened strong and active after the holidays, owing to the railway strike settlement in England. The news has been well described as the best since the Armistice, and those who had not lost faith in the outcome of the struggle during the previous week reaped their just reward. There were, of course, several checks to the almost general advance in prices during the week, but the upward movement could not be stayed. The Far East Rand favourites, as usual, led the way, and New Modders, on the definite announcement of the share-splitting scheme, made an appreciable advance. Modder Easts also continued their interrupted course, and the debentures on Thursday touched £270. City Deeps and Gedulds also advanced sharply, and both diamond and tin shares improved with gold stocks. The tendency in the market is decidedly bullish, and there seems every likelihood of a further improvement. The week's advance to Thursday is mirrored below.

	Thurs., 2nd.	Fri., 3rd.	Tues., 7th.	Wed., 8th.	Thurs., 9th.
African Farms	13 3*	13 0	13 6*	13 6*	13 9
Anglo-American Corporation	28 6*	28 6	31 3	31 9*	31 6
Apex Mines	7 6	7 3*	7 6*	7 6*	7 6
Aurora Wests	—	—		—	8 9+
Bantjes Consolidated	2 10*	2 10*	2 10*	2 11*	2 10*
Brakpan Mines	71 0+	—	75 0+	72 0+	72 6+
Bushveld Tins	2 4	2 3*	2 3*	2 3*	2 2+
Cinderella Consolidated	4 6*	4 6*	—	—	—
City and Suburbans	7 3*	7 3	7 3*	8 0	8 0
City Deeps	55 6*	54 6*	58 0	59 6	61 6
Clydesdale Collieries	28 0*	28 3*	28 0*	28 3	28 6
Consolidated Langlaagtes	20 9*	20 0*	—	20 3*	21 0
Consolidated Main Reefs	10 6*	10 6*	11 6	11 3	11 3*
Consolidated Mines Selection	26 0*	26 9	26 6*	27 9+	26 0*
Coronation Freeholds	2 3	2 2	2 2*	2 1	2 2
Crown Diamonds	9 3	9 6	10 0	10 6	10 0
Crown Mines	—	52 0*	60 0*	59 0*	61 6*
Crown Mines Debentures	£102*	£102*	£102*	£102*	£102*
Daggafontein Mines	23 6	23 9*	24 0	23 9	24 0+
Durban Roodepoort Deeps	8 0*	—	9 0*	—	9 0*
East Rand Coals	2 7*	2 6*	2 8*	2 8*	2 0
East Rand Deeps	1 0*	1 0*	1 0*	1 0*	1 0*
East Rand Mining Estates	26 0+	—	—	—	—
East Rand Proprietary Mines	5 8*	—	5 6	5 9*	5 9*
East Rand Debentures	£70+	£70+	£65	£65*	£65*
Eastern Gold Mines	—	—	1 6	1 9+	1 6
Frank Smith Diamonds	5 11*	6 0	6 0	6 0	6 0
Geduld Proprietary Mines	52 3A	55 3	59 0	57 6	57 8
Glencoe Collieries	6 0*	7 0+	6 0*	6 0*	7 6+
Glynn's Lydenburgs	19 0+	19 0+	19 0+	19 0+	19 0+
Government Areas	92 6*	92 3	93 6	93 0*	93 0*
Johannesburg Board of Executors	33 0*	33 0*	33 0*	33 0*	33 0*
Jupiters	4 3*	—	4 0*	4 0*	4 0*
Klerksdorp Proprietary Mines	1 8*	2 0	1 9A	1 9*	1 9*
Knight Centrals	5 9*	5 7*	6 3+	5 10	5 9
Knights Deeps	8 0+	8 0+	8 6+	—	8 6+
Lace Proprietary Mines	19 0*	19 6*	19 9*	19 9*	20 9*
Leeuwpoort Tins	31 3*	31 0	31 6	31 3	31 6
Luipaardsvlei Estates	3 0+	—	3 6+	3 3+	3 0+
Lydenburg Farms	8 3*	8 4*	8 6	8 4*	8 6*
Meyer & Charltons	90 0*	93 0	90 0*	—	93 0+
Middelvlei Estates	2 4*	2 6	2 5+	—	2 5+
Modderfontein B.	167 6*	168 0*	173 6A	170 0*	171 0A
Modder Deep Levels	46 9	46 6	48 3	48 3	47 6A
Modder Easts	33 4½	32 4½	33 3	33 1½	34 3
Do. Options (3 years)	13 4½	13 4½	14 1½	11 0	
Do. Options (4 years)	11 9*	15 0*	15 6	15 6*	16 1½
Hume Pipes	23 0*	23 0	23 0	23 0*	23 0
Natal Navigation Collieries	25 0	25 0	25 0		26 0*
National Banks	£15½+	£15½+	£15½+		—
New Boksburgs	1 6*	1 7*	1 9	1 6	1 6
New Eland Diamonds	28 0*	30 0	32 6*	33 6	36 0*
New Era Consolidated	11 3*	11 3*	11 6*	11 6	11 3*
New Geduld Deeps	2 2*	2 2*	2 2*	2 3+	—
New Kleinfonteins	10 6*	11 0	11 3	11 6	11 6
New Modderfonteins	£28½	£28½A	£29¼A	£29	£29½
Nigels	7 0*	7 0		7 3*	7 [illegible]
Nourse Mines	13 0*	13 0			13 9
New State Areas	31 9	32 [illegible]	33 6	33 6*	33 9
Pretoria Cements	85 6	85 6	87 0A	85 6*	87 [illegible]
Princess Estates	2 2	2 3*	2 6	2 3	2 3*
Rand Collieries	3 6*	3 6*	3 6*	3 6*	3 6*
Rand Nucleus	2 0+	2 0+	2 0+	2 0+	2 0+
Rand Selection Corporation	76 0*	76 0*	76 0*	—	76 0A
Randfontein Deeps	6 0+	6 0*	6 0*	6 0*	6 0*
Randfontein Estates	21 3	21 0*	22 7½	22 9	22 9*
Roberts Victors	12 9	12 0*	12 9	—	12 3*
Rooiberg Minerals	6 0*	6 0*	6 0	6 0*	6 9
Ryan Nigels	5 0	5 9	5 6*	5 6*	5 9+
Shebas	2 4*	2 4		2 3	2 4*
Simmer & Jacks	4 0*	4 0	4 0*	4 0*	4 0
Simmer Deeps	2 6+	2 0*	2 4	2 0*	2 3*
S.A. Breweries	—	37 0*	37 0*	37 0*	—
S.A. Lands	6 4*	6 4*	6 5*	6 9	6 9
Springs Mines	54 9	54 3	55 3	55 6	55 3
Sub Nigels	23 3	23 0*	23 9*	23 9*	22 6*
Swaziland Tins	20 0+	—	—	—	20 0+
Southern Van Ryns	8 6*	8 6*	8 9	8 3	8 3
S.A. Alkalis	35 0	34 0*	35 0	38 6	40 0
Transvaal G.M. Estates	16 0	15 6+	16 6+	16 0	16 3
Tudors	—	1 5+	1 2*	1 2*	—
Tweefontein Collieries	25 0*	25 0		25 0*	—
Transvaal & Delagoa Investment	8 0	80 0*	80 0*	80 0*	80 0
Union 5 per cent.	£104½	£104½		£104¼*	£104¾*
Van Ryn Deeps	79 6	78 9	80 6	80 6*	81 0*
Van Dyks	3 3	3 0	3 1	3 1*	3 6
Village Deeps	13 3		11 6+	13 9	14 6+
Village Main Reefs	7 6*		7 6	8 6*	
Western Rand Estates	6 9	6 8	6 9+	7 0+	7 0+
Witwatersrand Deeps	10 6	10 6	10 6*	10 6	10 6
Wit. Townships	31 0+	31 0+	27 6*	30 0+	—
Wolhuters	3 4	3 4	3 6	3 3*	3 3
West Springs	25 3	25 3*	27 4½	27 6	27 9
Do. Options	10 6	10 6	10 9	10 9	10 9
Zaaiplaats Tins	7 5	7 7	7 8	7 6	7 1*

*Buyers. †Sellers. AOdd lots. BEx London.

The Engineers' Directory.

Excellent progress is being made with the preparation of the S.A. Engineer's, Electrical and Allied Trades' Directory, which is now in the press. To ensure the utmost accuracy and completeness a vast amount of work has been entailed, and the book in its final form will be a complete directory of the firms engaged in the engineering, electrical and allied trades, *plus* a list of the personnel of the mines, railways and municipalities throughout the Union and Rhodesia. Firms who have not yet returned the forms sent to them are earnestly requested to do so without delay. In some cases firms have sent in the lists of their specialities for the Buyer's Guide Section without signing them, and it would much simplify the work of compilation if firms conscious of having made this omission will communicate the fact to the Publishers, care of this journal.

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TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Low Grade Mines Commission and the Buying of Machinery and Stores, etc.—Iron and Steel—Agricultural Implements—Timber and Building Materials—Bricks and Cement—Electrical Goods.

At the Low-Grade Mines Commission on Tuesday some very illuminating evidence was brought forward, and a summary thereof should not only be interesting but valuable information for future reference. It was elicited that in regard to the system of buying on the mines there were no such things as tied houses and secret commissions paid in respect of machinery supplied to specified financial houses. Indeed, in the course of the sitting, it was distinctly stated that there was a clause in the contract made by the leading corporation that any such action on the part of suppliers would at once vitiate such contract. Allowing for any natural bias in respect of such contracts and the frailties to which human nature is heir, one can only come to the conclusion that so far the evidence before the Commission has affirmed the honesty of purpose of the different houses in regard to their dealings with suppliers. A further interesting point was made that the more merchants in the field the better it was for the mines, as they tended to cheaper buying. It was further stated that there was no truth in the statement that low-grade material finds its way to low-grade mines, thus preventing such mines doing as well as they might. With regard to the suggestion that an industrial museum where various articles used by the mines should be established, replacing the traveller who pushed his goods along the Reef, it was stated that such an innovation might possibly serve a useful purpose, although, as things wanted for the mines change so often, it might not be so useful as generally thought. It was further stated that South African manufacturers had full facilities for quoting for supplies. Further, that it was better for the industrial groups to come into the market every month or so than for only one inquiry in six months, for the reason that if the latter obtained the competitors would be limited, and then it would be easy for such competitors to regulate prices. It was further stated that the group system of purchasing, instead of allowing each mine to buy separately, was as near efficiency as it was possible to arrive at. In reply to the question whether economies could not be effected if a co-operative wholesale department came into existence, carrying one lot of stocks, it was pointed out that this would reduce competition. As regards forming a monopoly against steel producers, it was stated that they had forced the hands of the Sheffield manufacturers by placing orders for American steel. Before the war there was plenty of competition as far as steel was concerned, and when normal conditions arrive that competition would again prevail. With regard to the Standardisation Committee appointed by the Chamber of Mines, it was for those controlling the groups to adopt its decisions. The tendency was to make standardisation effective. It was also disclaimed that some of the mines had been compelled to purchase the whole of their machinery through certain channels and that some of the mines controlled by German finance had to go to certain firms for their machinery. Further, there had been no tendency to economise in stores to such an extent that efficiency was affected. With regard to representatives of the workers having some say in the buying of stores, both as regards quantity and quality, it was stated that they had some say now and can make suggestions, which would naturally be carefully considered, but it had been found that the present method of group buying, which had been in vogue for over twenty years had been found both economical and efficient, as it permitted of greater competition and was less costly and cumbersome than the system of each individual mine buying its own supplies.

Official Statement.

Evidence was further given by the Transvaal Chamber of Mines to the effect that the method of buying stores, now in force, was that known as group buying, under which all mining stores and materials were purchased through a group buyer. The procedure is as follows: (1) The mines send in their requisitions daily, or as occasion demands, to the group buyer. These are scrutinised by him and, with the exception of certain special lines, and such other items as are already contracted for, are placed on the various enquiry boards at the Commercial Exchange, for open competition amongst merchants. Those merchants who are not members of the Commercial Exchange are also given facilities to quote for these requirements. The tenders are then tabulated, and carefully examined by the buyer, who forthwith places the orders, giving due consideration to quality, suitability and price. When necessary, samples are called for, and submitted, if need be, to the mine or to the technical experts of the group, for their advice. Similarly in the case of many items, tests and analyses are made from time to time, with a view to determining the quality. (2) The official orders are then issued to the merchants, who, in turn, deliver the goods to the mines, those for the more distant mines being delivered by rail or lorry, as circumstances demand.

Iron and Steel.

Business has gone off somewhat since the beginning of the month. One reason is that the demand has not been so great from the engineering shops and foundries. The official price of Vereeniging mild steel is 35s., and Dunswart bar iron 30s. per 100 lbs. The imported bar iron in Johannesburg is from 35s. to 45s., and flats 35s. to 42s. 6d., both according to the sizes. A parcel of English steel shafting, 1½ in. to 4½ in., has just come to hand in Johannesburg, being the first consignment for a very long while. Since this consignment was purchased two rises, each of 10 per cent., have taken place at the English factory, and according to the latest cables the highest limit is said not to have been reached. The selling price of steel shafting is 9d. per lb., which compares very favourably with the second-hand at 1s. per lb a few months ago. Imported mild steel in Johannesburg is 37s. 6d. to 45s.; steel plates, 41s. 6d.; drill steel, 7½d. per lb., high speed tool steel, 5s. 6d.; and ordinary,

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1s. per lb. Brass rods and plates are from 2s. 9d. to 4s. 6d. per lb.; shovels, 70s. a dozen; wheelbarrows, 50s. each; ordinary wire nails, 35s., with an advancing tendency. The feeling is that all hardware prices are very firm indeed and will remain so for some considerable time, with here and there an advance. Second-hand battery stems have been sold at 35s. per 100 lbs. of about 16 ft. length. The seller thinks this is an excellent sign that the mines are gradually getting out of their reserve stocks and are buying the best of second-hand lines when available. A Johannesburg merchant now in London has written by the mail just arrived saying that he cannot buy anything in England sufficiently reasonable to export to South Africa. He attended the Government sale of motor cars with the view of purchasing one for himself for use in England and maybe to bring it back to South Africa, but a decent second-hand car of a model dating back six years realised £650. The sale opened with five three-ton Stevens petrol electric lorries, and the auctioneer announced that the purchaser of the first would be given the option of buying the five at the same price. The bidding opened at 400 guineas, but quickly rose to 1,100 guineas, the final bid being 1,150 guineas, at which price the buyer exercised his option and took the five. A number of A.E.C. lorry chassis was sold at from 800 to 900 guineas. There was also considerable competition for the Rolls-Royces and the three fitted with body and accessories fetched 2,100, 3,050 and 3,250 guineas. The Minister of Munitions quoted a second-hand lathe, weighing 20 tons, for £5,000. Other machines also were quoted at similar exceptionally high prices, and therefore, as previously remarked, could not be bought as a speculation to be forwarded to South Africa. There are plenty of local inquiries for all classes of engines and boilers, and quotations have gone up quite 10 per cent. for second-hand engines and boilers. The trouble in the second-hand yards is to obtain mining material as well as engines and boilers. Some of the boilers are now being thoroughly renovated that would hardly have been looked at about two or three years ago. This is fortunate for the engineering artisans who are not overburdened with employment just now—in fact, there are a few out of work.

AGRICULTURAL IMPLEMENTS.

The serious drought seems to have kept farmers back from visiting Johannesburg, excepting for the occasional demand for windmills and for small oil motors as auxiliaries. The dealers are very short of anything like assorted stocks, especially Canadian ploughs, which have been a feature for use by our agriculturists. There should be a large shipment arriving from Canada by the end of this month or beginning of next, when it is to be hoped the rains will have come and so enable ploughing to be commenced, which obviously cannot be done at present. According to a farmer from the Eastern Transvaal, it is said that springs and spruits which formerly never failed, are now dry. The cattle had died in droves as no feed is obtainable except in a few places where there are some willow leaves. One farmer alone has lost 300 sheep, and lambs are so weak that they cannot stand, and cows are in such poor condition that when calving they have no milk. This is sad reading, because at one time there was a great to do at our show yards, accompanied with specimen silos. Australia and the United States of America have a very similar climate to South Africa, and in both of the countries named the surplus crops are siloed, pitted and stacked each year for the supply of food for the cattle when the veld is bare. This question of ensilage has been neglected in this country and must be revived, because even when we do get a little more irrigation the ensilage and any other way of storing fodder must always be encouraged from every year to every year. Irrigation and ensilage are the two things that will prevent this grand country of ours from having these constant and terrible losses of stock. By the way, there are many inquiries from time to time for ploughing tractors, and a tractor was sold during the week, but the price did not transpire; the price, however, of American tractors ranges from £300 to £500 each, and so far there are not many in the country, but when the right tractor comes along and works well at our altitude on the Rand the implement dealers state there will be a great future for them, as a large number of well-to-do farmers can afford the expense, and, for example, after a drought they could rush ploughing forward at two eight-hour shifts a day, thus enabling them to break up the soil in about a tenth of the time it now takes by oxen.

TIMBER AND BUILDING MATERIALS.

The feature of the week is the utter absence, in wholesale quantities at all events, of galvanised roofing iron, both new and second-hand. The nominal price for new is 1s. 4½d. to 1s. 5½d., and second-hand 1s. to 1s. 2d., according to quality, but fortunately we shall get a little relief within a week, as there is one shipment already on its way for Durban, which will relieve the present acute tension, as so many roofs are awaiting the roofing iron. A letter was received from the coast on this subject stating that an importer sold a shipment immediately on its arrival from England and repeated the order by cable, and to his surprise the British manufacturers had raised their price £3 10s. a ton. The timber market is firm, as the mines have commenced to buy a little and there is always a great demand from the builders, but prices are about stationary because some Baltic timber is just beginning to arrive in Johannesburg. Deals, 1s. 7½d. to 1s. 8½d.; floorings, 8½d. to 8¾d.; ceilings, 6d. to 6¼d. per ft. American hardwood timber is getting dearer. Oak is 1s. 6d.; poplar, 1s. 9d.; shelving, 1s. 2d. per ft., and the demand is excellent since the cabinetmakers' strike was settled. The second-hand yards still complain of not being able to do business on account of the exceeding scarcity of stocks, therefore no sound quotation can be given. The proprietor of one yard says that he thinks they are in for a poor time, as he cannot at the moment anticipate where the supplies of second-hand building materials are coming from, as it does not pay to pull down the old pioneer houses, because they are all let and very much over-applied for when it becomes known that one is likely to become vacant.

BRICKS AND CEMENT.

It is practically impossible to-day to obtain bricks, as they are being used up quicker than they can be produced; although no change has as yet occurred in prices, the tendency is for them to go higher, as the scarcity is becoming more and more pronounced. Cement still remains unobtainable. Another real difficulty about getting bricks is the delivery, for although the expense in a measure is a secondary consideration, yet owing to the drought there is not a particle of feed for the oxen and the expense of artificial feeding has never been so high before.

ELECTRICAL GOODS.

Tubing is getting scarcer than ever, and there is practically none in town; consignments are on the way, but it is impossible to say when they will arrive. Lamps have not increased in price yet, but the tendency is for them to harden, and unlike six or eight weeks ago, when these were sold freely in order to secure other orders, dealers are not evincing any eagerness to dispose of stocks on hand. Indeed the tendency is for all electrical materials to go up in price. Town and country business remains good.

A FEW STRAY NOTES.

The foundations are being prepared for the new Chamber of Mines' building, in Marshall Square, immediately opposite the south-east corner of the Stock Exchange. An American import house says that a few more orders have been placed for piping and steel goods, but very little, however, for steel plates, in which a shortage is expected in six months' time. Importing merchants are loath to stock goods for the mines in any quantities, but often go to the mine buyers and say: we will import such-and-such at 2½ per cent. on cost and charges. This procedure is undoubtedly owing to the world's unrest in labour conditions, therefore the absence of anything solid as regards prices is practically nil. This may work itself right; in the meantime, what is there to prevent the buyers saying: we can import and save the 2½ per cent. charges. What the mines require is to revert to pre-war conditions when huge stocks were carried by the merchants and so the mines could get anything required immediately. The fencing and wire-working factories for the screenings and similar things required by the mines, made here instead of imported as formerly, are several weeks behind in fulfilling orders already on hand.

We are informed that Mr. Patrick Duncan, C.M.G., has accepted a seat on the board of Messrs. Robert Hudson & Sons, Ltd., in the capacity as Chairman of the company.

New Kleinfontein.

Appended are details of the operations on this company's property for the month of September: Stamps, 200; days, 27; tube mills, 4; tons milled, 44,740; gold recovered, 15,616 fine ozs.; net value, £65,586; profit, £3,337; working costs per ton (excluding development), £1 5s.; development to working costs per ton, 2s. 10d.; total working costs per ton, £1 7s. 10d.; capital expenditure, £1,182. The revenue includes a further clean-up of the Apex reduction works. The published results do not include the increased price now being obtained under the new arrangement for the free disposal of the gold shipped since July 25 last. The gold so far sold is equal to slightly under one month's output of the Witwatersrand and has realised a premium of approximately 16 per cent. Any increased profits obtained by the company will be published quarterly after receipt of account sales.

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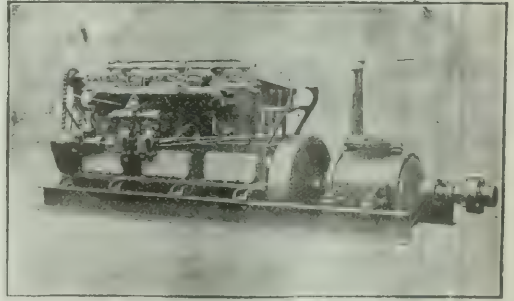

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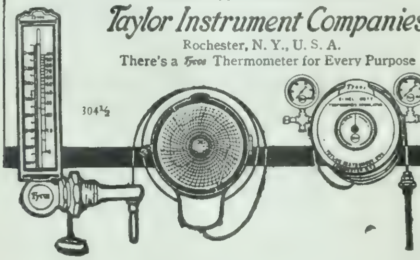

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Notes and News.

The Mining Exhibition.

The Fourth Annual Mining Exhibition to be held by the Chemical, Metallurgical, and Mining Society, which was notified to open from the 5th to the 12th November, has had to be postponed. It will now be held in the Assembly Hall of the School of Mines, Johannesburg, from the 21st to 31st January, 1920, and entries will close on the 31st December. It should be noted that the Exhibition is being held under the sole auspices of the C. M. and M. Society.

* * * *

Springs Mines.

The Kimberley slates have been encountered at a depth of 2,089 feet in the No. 3 Shaft. This information, and the data obtained in respect to the position of the reef in the Southern Section of the present mine, indicate that the main reef in No. 3 Shaft may be reached during May next, at a depth of about 3,400 feet. It is expected that the necessary plant will be ready to start sinking operations at No. 4 Shaft immediately upon the completion of the work at No. 3 Shaft.

* * * *

A Big Delagoa Bay Contract.

A contract was signed during the week by the Delagoa Bay Engineering Works, Ltd., for the erection on behalf of a strong Rand syndicate of a palatial, new hotel at Delagoa Bay. The contract, it is understood, amounts to £120,000; and the work will be put in hand immediately. The firm which has been successful in securing this contract has, it is understood, opened a branch at Mombasa, and is thus extending its activities. Consolidated Gold Fields capital is now interested in the Delagoa Bay Engineering Works, Ltd.

* * * *

Progressive Mine Officials.

Professor Yates' lecture theatre is proving inadequate to meet the present large enrolment of underground officials, but steps are being taken to prevent inconvenient crowding. This journal takes to itself no small credit for th [illegible] along the Reef, which is manifesting itself in t [illegible] for technical education and Government certificat [illegible] in and year out we have strongly urged that our mi [illegible] had a duty to themselves and to the industry, that duty being to acquire the requisite education and the qualifying technical certificates, thereby increasing their personal efficiency and value; and we have always supported Professor Yates' strenuous and very successful work in this important direction. With the existing liberal wages schedule, fixed minimum rates of pay, and bonuses, the future of the industry is largely dependent on the efficiency and the intelligent work rendered in return by its workers, and we regard the desire for technical education as evidence that this is being realised.

* * * *

Modder East.

One or two points in our recent article on the Modder East require to be elucidated. Thus it should have been made clear that before the Apex mill could be availed of for milling purposes other parties had to be considered and negotiations with them satisfactorily completed. Again, the actual milling stage cannot, of course, be reached before the shafts are connected up, and all that it is proposed to do in the meanwhile therefore is to crush the development rock taken from the workings as a bulk test sample of the ore. In regard to the ore reserves, it is too much to expect that these are to be re-estimated every three months, as we unwittingly were led to assume. The fact is the ore reserves were specially estimated for the purpose of the special meeting to consider the issue of the debentures, and were again a few months later estimated for the purpose of the annual report, as at June 30. It is not the practice of Rand companies to re-estimate their reserves each quarter. The practice would be open to several objections, the chief of which is that the actual work of development done in the quarter would often not be reflected in fully developed reserves.

C. M. & M. Society.

The October meeting of the Chemical, Metallurgical and Mining Society takes place this evening, when papers on "Hanging Wall Support on the Far East Rand" and "Gold and Base Metal Mining in the Pretoria District" will be read by Messrs. L. W. Macer and T. G. Trevor respectively. Interesting contributions on papers already read are also promised.

* * * *

A Mines Department for East Africa.

Mr. Hobley, of the East African Administration, paid a visit to the Rand recently for the purpose of making himself familiar with the mining industry. Mr. Hobley has been entrusted by the East African Government with the task of organising a Mines Department and a Geological Survey of that country. A substantial lump sum has been voted to him for this purpose, and he is on his way to England to engage expert geological assistance. Hitherto, British East Africa has proved itself singularly lacking in minerals, the thick vegetation making the task of the prospector very difficult. The East African Syndicate, it may be remembered, did a good deal of unremunerative work in the country some years ago; and beyond mica, no mineral discovery of any importance has, we believe, yet been made. Coal, of course, is the great desideratum, and wood is still the chief fuel used on the Uganda Railways. We hope Mr. Hobley's mission will prove fruitful, and that the progressive policy of the new Government of East Africa may be duly rewarded.

* * * *

Reef Municipalities and the Low-Grade Mines.

Representatives of Germiston, Boksburg, and Krugersdorp Municipalities gave evidence this week before the Low-Grade Mines Commission. The statement made by Germiston was that the closing of two of the low-grade mines within that Municipality would be a most serious matter to the commercial and municipal credit of Germiston, quite apart from the ordinary revenue received by the Government from pass fees. In addition, there were multifarious sources wherefrom the Government of the country received revenue, such as direct and indirect taxation. Krugersdorp Council pointed out that all mines in Krugersdorp municipal area were classed as low-grade mines. In event of any of these mines closing down, it would have a very serious and detrimental effect on the community of Krugersdorp and district, by reason of the fact that 2,200 white employees now working on the mines would be thrown out of employment. Boksburg Council pointed out that the closing down of the low-grade mines would mean loss to the trading community, depreciation of property values, and loss of revenue to the towns in the assessment rates, and serious unemployment would result, and there would be retrenchment in businesses and municipal service owing to the curtailment of work. The representatives made various suggestions with the object of alleviating the situation.

* * * *

Armstrong-Whitworth and Mains.

Preliminary arrangements have been completed for the amalgamation of Messrs. A. & J. Main & Co., Ltd., of Glasgow, with the engine works department of Sir W. G. Armstrong, Whitworth & Co., Ltd. Messrs. A. & J. Main & Co., Ltd., was registered in January, 1896, to acquire the business of iron roofing, bridge, and fence manufacturers of the firm of the same name, and, in addition, owns 13,400 ordinary shares of £1 out of an issued capital of £17,432 in Messrs. A. & J. Main & Co. (South Africa), Ltd. For some years past there has been a close working association between Messrs. Main and the Armstrong, Whitworth Co., and henceforth the Clydesdale and Germiston works of Messrs. Main, together with the adjoining Glasgow engine works of Sir W. G. Armstrong, Whitworth & Co., Ltd., will be brought directly under one management. A new company, under the title of Messrs. Armstrongs & Main, Ltd., has been formed, with Mr. John Noble, of Newcastle-on-Tyne, as chairman, and Mr. James A. Main as managing director. The other members of the directorate will be Sir Percy Girouard, K.C.M.G., Sir Glynn H. West, Mr. C. O. Ridley, Mr. George R. Main, and Mr. Andrew Machaig. We are informed that Messrs. A. & J. Main & Co. (S.A.), Ltd., whose offices at Capetown and Johannesburg have been established many years, are representing the combined interests of the new company of Armstrongs & Main, Ltd., in South Africa. We understand that they will also handle the representation of the great armament firm of Messrs. Sir W. G. Armstrong, Whitworth & Co., Ltd., whose extensive works, since the armistice, have been entirely reconstructed for manufacture of commercial products. We hasten to offer a hearty welcome to this new representative of historic British engineering enterprise in our midst.

* * * *

The Rhodesian Mining Outlook.

At the meeting of the Selukwe Gold Mining Company, held recently, the chairman (Mr. Cromwell Hockley) dealt with the general outlook in Rhodesia. He said that a big rise had taken place in the price of all mining requisites in Rhodesia. How serious a blow that had been to the country was reflected by the fall of nearly a million sterling in the year's output of gold, and nearly two millions from the highest output reached. The Imperial authorities had at last seen the absurdity of depriving the Empire's producers of the premium which gold had commanded and would command as an exchange medium, and now that the mischief was done and mines had been closed or operated at a loss mineowners, it was understood, were to be allowed to dispose of their gold to the best advantage in a free market. He learned from the Press that Rhodesia was to enjoy that right, but he thought that a considerable time might elapse before conditions in Rhodesia became anything like normal again. Just as in other countries, a rise in commodity values had caused a rise in wages, though on nothing like the same scale as in old, badly remunerated industrial centres. Then there was the shadow of a big political upheaval in Rhodesia caused by the imminent passing of the chartered form of government, which was bound to have an unsettling effect in a small community for some months. Experience showed that all democratic governments were very much more expensive than those of any other type. In countries which produced minerals it was a favourite policy to saddle the mining industry with an undue proportion of the taxation for the reason that the mine shareholder was usually a foreigner and voteless. Doubtless the mining shareholder in Rhodesian enterprises would continue, perhaps in an aggravated form, to tread the same thorny path as that experienced by investors elsewhere.

* * * *

Technical Education for Colonial Students.

For some time past the Trade and Industry Committee of the Royal Colonial Institute has been interesting itself in the question of providing facilities for Australasian and Canadian students, apprentices and improvers to enter British works for the purpose of qualifying in professional and industrial technical vocations. Having ascertained the feeling of the Dominions on the subject, as well as of firms in the United Empire, the committee has decided to give any assistance in its power to promote this desirable inter-Empire relationship. It is strongly felt that the alternate to some definite action being taken to facilitate the young men of the Dominions gaining experience in British industry will be to drive them into American factories, where they will naturally acquire a preference for the products and manufacturing standards of that country, which will afterwards influence the trend of Dominion trade. The committee has also decided to place similarly its facilities at the disposal of South African, Newfoundland and Crown Colony students. Correspondence on the subject from Universities and schools oversea will be promptly dealt with, as will letters from individual applicants. Enquiries should be addressed to the Secretary, Trade and Industry Committee, Royal Colonial Institute, London, England.

TOPICS OF THE WEEK.

A GOLD AND EXCHANGE CONFERENCE.

The late Mr. Labouchere once described the asylums of England as being filled with dipsomaniacs, meglomaniacs, and exchange and currency experts! Apparently the Union Government has been so bewildered by the sane variety of the latter—chief among whom is our respected contemporary the *Cape Times*—that it has decided to call a conference to advise it on the whole subject. The personnel of the conference, as announced this week, is as follows:—The Minister of Finance (in the Chair), Sir Evelyn Wallers, K.B.E., Mr. J. W. Jagger, M.L.A., Lieut.-Colonel F. H. P. Creswell, D.S.O., M.L.A., Mr. C. T. M. Wilcocks, M.L.A., Professor R. Leslie, Messrs. J. G. van der Horst, E. Oppenheimer, E. C. Reynolds, Hector McKenzie, J. S. Shiel and H. C. Jorissen. It will be noted that the banks and the merchants are well represented, and among the latter are doubtless to be discovered the authors of the recent *Cape Times* thunder! The terms in which the conference is called merit putting on record. "The Union Government," we are told, "being desirous of ascertaining the effect on the cost of living and industrial and trade conditions in the Union of the abnormal conditions of exchange arising out of the war, has decided to call a conference to advise them upon the following matters: (1) The feasibility and desirability of establishing natural exchange rates between the Union and the rest of the world, and the probable effect upon Union industry, commerce and the cost of living. (2) The possibility of establishing a free market for gold in the Union, the practical steps necessary to that end, and the measures which may be necessary to prevent the drainage of gold coin from the Union under existing conditions." It seems to us that the calling of this conference is done at the behest of a few merchants who appear to have the ear of the Government. Certainly we have no evidence that it is called out of any anxiety to benefit the mining industry. In the sale of its product to the best advantage, surely the latter can be trusted to look after itself, and to do without the advice—however disinterested—of the coast merchants and banks who have now been called into council! Indeed, an official statement issued by the Chamber of Mines last week leaves no doubt upon the point. Replying, obviously, to the *Cape Times*, the Chamber says: "The agreement recently concluded for selling the produce of the Witwatersrand gold mines is being subjected to some criticism in the South African Press and elsewhere. As this criticism would seem to be due, in considerable degree, to a misunderstanding of the actual facts of the case, the Chamber of Mines deems it advisable to offer a few brief observations on the situation." In order to remove the impression in certain quarters that the terms of the arrangement are being withheld, the Chamber of Mines publishes in full the terms of the agreement recently entered into with the Bank of England. Formal publication of the document in the columns of the Press has not hitherto been considered necessary because the substance had already been made public in the evidence on the subject submitted to the Low-Grade Mines Commission. This agreement shows that except for such cash advances as may be required by any of the producing companies, the Bank of England receives no payment for its services. "This," says the Chamber, "should remove the impression that the Bank of England charges form a substantial item in the costs of disposal of the gold, for under the agreement it is merely the consignee. Further it is clear that the market for the gold is free; it can be sold as a commodity or otherwise and to any part of the world which permits the import of gold. It will be seen also that the producers have it in their power to determine the agreement on giving six months' notice. Thus, if it should appear from the experience now being gained that some better and more profitable method of disposal can be adopted, there is nothing to prevent the producers from terminating or modifying the agreement." This would seem to be a very fair and businesslike statement of the case. In regard to the Mint, which it will be recalled was decided upon before the market for gold became free, the Chamber says:

> "It has been urged that it would be much more profitable to the producers, and to South Africa as a whole, if the gold, instead of being shipped in its raw state to London for sale to the highest bidder, were refined and minted in the Union and thereafter allowed to flow direct to the gold markets of the world. Given the requisite local facilities, this argument may be perfectly sound. But a Mint, although sanctioned by Parliament, has not yet been erected—nor have arrangements yet been completed for the establishment of a Refinery, although this subject is receiving active attention at the present time. It follows that until these essentials are completed the foregoing alternative is not practicable; and the agreement now in force may, therefore, be regarded as the best means of bridging the period until more favourable conditions obtain. It must, however, be borne in mind that rapid, frequent and safe means of ocean transport play an important part in the marketing of a commodity such as gold—the risk as well as the question of loss of interest having to be taken into account. Ocean communications with this country are improving, but apart from those between South Africa and the United Kingdom they are not yet such as to justify the industry in changing its system of selling its product."

From the point of view of the mining industry nothing more, at the moment, remains to be said; and we doubt if the proposed conference can serve any purpose other than to allow of the airing of views, that may be open to criticism as either academic or not entirely disinterested.

Prospects in the South-West.

In the course of his annual report, the Administrator of the South-West Protectorate writes: "Many of the German inhabitants entertain the belief, notwithstanding the present condition of affairs, that a boom will be experienced in this country in the near future. They base this on the expectation that there will be a rush of people hither for farms, and that in their wake will follow the usual proportion of other elements who will settle in the towns. They are accordingly, as is perhaps but natural, asking very high prices for such farms as they wish to dispose of. . . . There are large unoccupied areas in the country suitable for settlement, but much of the land is claimed by concession companies, such as the South-West Africa Company and the Kaokoveld Company, and the greater portion of the unoccupied Crown lands is without open water and lies at considerable distances from existing centres of population. A very large expenditure on bores, wells, or dams will, moreover, be necessary to make these lands available to the settlers; but such expenditure will, undoubtedly, be amply justified, as the country offers unexampled opportunities for ranching. There will, therefore, in all probability be a period of stagnation in Protectorate commercial circles; but I am of opinion that this will not adversely affect the revenues of the Protectorate, the bulk of which, for some years to come, will be derived from the tax on diamonds. The position of the farming community is, on the whole, eminently sound, and each year sees better prices for the slaughter stock available for sale. This is, however, a land of big farms mostly fit for ranching purposes only, and wide distances, and closer settlement is not to be thought of except in limited areas along the Fish River, in which in years to come it may be found practicable to embark upon conservation and irrigation schemes. The rural European population will for many years remain a small one in comparison with the size of the country, though perhaps as civilisation extends and tropical diseases are overcome a population of greater density may be supported in the north-eastern (Okavango) area on sections which are at present almost wholly unexplored, but which in the matter of rainfall, soil and native labour possess many advantages not found in the rest of the Protectorate, and may be expected to be suitable for crops such as cotton, tobacco and grain.

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Full Official List of Mineral Occurrences Specially Compiled for S.A.M & E. Journal.

[*By Our Special Commissioner.*]

UNDER the late German Imperial Government practically the whole of the present South-West Protectorate was given out to Concessionaries (mining and land and mining companies). The following is a list of the eight principal companies who held mining and surface rights: (1) German Colonial Company for German S.W. Africa; (2) The German Diamond Co. (subsidiary to No. 1); (3) The Pomona Diamond Co.; (4) South African Territories, Ltd.; (5) South-West Africa Co., Ltd.; (6) Otavi Mining and Railway Co.; (7) Hauscatic Mining Co.; (8) Kaoko Land and Mining Co. Nearly all the above companies permitted prospecting in the areas under their control. Some parts, however, were closed altogether. Only a German subject could hold a mining title. Claims were pegged without first taking out a prospecting licence; when a claim had been pegged, however, notice had to be given as soon as possible to the Mines Department, the maximum time allowed between pegging and notification being four weeks. Licences were issued and licence moneys and royalties collected by the Government on behalf of the companies. Under the German Imperial Mining Ordinance a prospector could peg: (a) (1) Gold, silver and platinum; (2) precious stones. (b) (1) All metals not mentioned above; (2) semi-precious stones. The size of a precious metal claim (a) was 200 x 400 metres and a base metal claim (b) 600 x 1,200 metres, claims to be rectangular in shape and horizontal. The licence for a precious metal claim was 10 marks per month per claim, and for base metals 5 marks per month per claim, all licence moneys had to be paid in advance half-yearly. Before commencing work a prospecting claim had to be converted into a mining claim. A mining claim had to be properly beaconed and surveyed and must have the shape of a rectangle and fall within the boundaries of the prospecting claim. Mining operations had to be commenced within two years of the granting of title. The prospector had to bear the cost of survey and demarcation. The taxes on a mining claim consist of licence moneys and a royalty. The licence for precious metals (a) was 30 marks per hectare, and for base metals (b) 1 mark per hectare, but not less than 30 marks per annum. The mining tax or royalty was 2 per cent. of the gross value of the minerals at the shaft head before treatment. For diamonds special royalties were levied. It is the intention of the present administration to throw open the whole country, with the exception of certain reservations to be mentioned later, to the prospector, on the 1st of January, 1920. In the meantime no prospecting will be permitted, but the authorities are considering a scheme whereby *bona fide* prospectors will in the meantime be allowed to visit and inspect known mineral occurrences under some sort of permit system. The country will be thrown open under the old German mining law, with certain amendments. A translation of the law together with maps is being prepared and will be available later on. The areas reserved and closed to all prospecting consist of a strip of country between the 26th degree of south latitude and the Orange River, extending 100 kilometres inland from the coast, Amboland and the Caprivi Belt. The coastal strip covers the working diamond-bearing areas. Amboland is covered to a considerable depth by surface sands and presents no rock outcrops. The so-called Caprivi Belt consists for the most part of a low-lying malaria-stricken swamp in the valley of the Zambesi River. The following list of mineral occurrences has been compiled from records in the Mining Office, Windhuk, S.-W. Protectorate, and supplied by the courtesy of the Inspector of Mines for publication in the S.A. *Mining Journal* for public information:—

Apatite.—Near Haigamkhab (Swakopmund).

Asbestos.—Trimolite: Pforte and Karabib. Serpentine Near K.M. 15 of the Otavi railway line.

Beryl (Heliodore and Aqua marine).—Near Rossing and Donkerhoek, district Swakopmund, and in the Namib.

Coal.—Districts Gibeon (eastern part reserved to the Treasury), Berseba, Keetmanshoop.

Corundum.—Ariams and Khomas Mountains.

Copper.—Matchless Mine, Omboroko Mountains, Narib, Gorob, Husab, Potmine, Arib, Okamuva, and other places near Otjozongatl, Eros Mountains.

Cobalt and Nickel.—Arib, near Rehoboth.

Copal.—Along the coast near Possession Island and Halifax Island.

Gold.—Choricas, near Kaoko boundary, Kuujas, Kuibis, Zwartmodder, Abib, Spitzkop, near Rehoboth, Natas, Chues Mountains. Small amounts of alluvial gold in the various tin fields.

Hæmatite (see also *Iron*).—Franzfontien (Kaoko Land and Mining Co. boundary) and Schweikardtsbuinn—28 K. N. of the water place Gauas Okawa and other places in the Kaoko Territory—large deposits.

Iron (see also *Hæmatite*).—Various places in the Kaokofeld, Garub Mountains, near station Garub, west of Kaukasib, district Luderitz. Large deposits in the Namib, between Luderitz and Swakopmund.

Limestone.—Near Okahandja, Okakango.

Lead (Galena).—Duwisib, Kleinfontien, south of Aiais (S.A. Territories).

Mica.—Rossing and Uelwitsch, near Swakopmund.

Marble.—From Swakopmund (Kubas, Abbabis—Africa Marmor Co.), Karibib.

Monazite.—Small traces around Erongo Mountains, together with wolframite and tantalite, and in the various tin fields.

Molframite.—Near Tsumeb. Bobos and Otavi Valley, and at Rietfontien, near Grootfontien.

Molybdenite.—Minor deposits near Otjozongati, Okamuvia Khan Mine, etc.

Nickel and Cobalt.—Areb, near Rehoboth.

Oil.—Found in bituminous shales in boreholes (for coal) in the district of Gibeon.

Rock Salt.—Kuiseb, district Swakopmund.

Rose Quartz.—Near Rossing, Swakopmund.

Scheelite.—Natas, Windhuk and Rehoboth boundary.

Salt.—Etoscha Pan, Aminuis Pan.

Silver.—In galena, near Duwisib (Maltahohe), and near Karabib.

Tantalite and Columbite.—Donkerhoek, district Swakopmund, and in various tin fields.

Tin.—Ameib, Nemesis, Onguati, Otjimboyo, Kohero, Uis, Brandberg (Namib), Etemba.

Topaz.—Many places in the Namib, between Erongo Mountains and coast.

Uranium.—Traces at the Ida Mine, Swakopmund.

Wolframite.—Ida Mine, near Swakopmund, Pforte, in various tin fields, Kain-Kharras, Omievi Mountains, district Windhuk.

Zinc.—Khan Copper Mine.

Working copper, lead and diamond occurrences not mentioned. Under the late German Government prospecting by aliens was discouraged, so that the South-West Protectorate has received very little attention from experienced prospectors. A very large part of the country is geologically favourable to the occurrence of minerals and is well adapted to prospecting owing to the sparse vegetation and proportionally large rock outcrops. The great and serious difficulty that will face the pioneer is the lack of surface water, the greater part of the country being semi-desert.

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GOVERNMENT REPORT ON THE PRIESKA NITRATES.

Judicial Survey of the Origin, Occurrences and Commercial Possibilities of the Deposits—Their Interesting History and the Present Position.

With commendable enterprise the Government has issued through the Geological Survey a valuable memoir on the Prieska nitrate deposits, by Messrs. Frood, Inspector of Mines, and A. L. Hall, of the Geological Survey. In a foreword, the Director of the Survey says: "In view of the renewed interest being taken in these deposits as a possible source of nitrates on a commercial scale, Mr. Hall's discussion of their occurrence and origin is important, and Mr. Frood's discussion of the values required for the successful working of the deposits adds greatly to the use of the joint reports to those interested in their commercial aspect. Mr. Hall's investigation corroborates and extends the conclusions reached by Dr. Marloth twenty-five years ago, for he shows that the quantity of nitrates observed is compatible with the quantities to be got by bacterial action on the excrement of small animals, accumulated and preserved under the conditions obtaining in the district. Co-operation between an Inspector of Mines and an officer of the Survey, and the joint publication of their reports in a Memoir of the Geological Survey, follows the precedents of the Memoirs on the Waterberg Tin Fields and the North-Western Zoutpansberg." Mr. Frood's conclusions may be summed up, in his own words, as follows:—"It is submitted that the following conclusions are fairly justified: (1) That, consequent upon favourable climatic and other conditions, deposits of nitrates, particularly potassium nitrate, are now found in the cliff faces and underlying débris over a wide region in the neighbourhood of Prieska, covered by the rocks of the Lower Griqua Town series. (2) That, apart from values contained at places in the underlying débris and talus accumulations, concerning which very little is known, the only ascertained concentrations, affording promise of payability, occur in limited sections along the bases of the main cliffs or krantzes. (3) That, in the almost entire absence of systematic prospecting and investigation up to the present time, practically no data are available as to how far values may persist either on the dip of the formation or vertically upwards or downwards, but that considerations of origin point to a strict limitation of payability in any direction. (4) That, nevertheless, in view of the considerable enrichment found at a few places and of the great extent of cliff faces existing on such farms as Prieska's Poort and Spitzkop, and affording chances of other discoveries, the further exploitation of such properties constitutes a legitimate mining risk, warranting the expenditure, at the least, of a moderate capital. (5) That, alike in view that possibilities cannot be considered altogether exhausted by the investigations so far made, and that the rewards of entire success on any basis, if attained, must be so great, the proposition should prove sufficiently attractive for private enterprise, without Government assistance at the present stage. It only remains to acknowledge indebtedness to the South African Nitrate and Potash Corporation, Ltd., for much assistance courteously given us in course of our inspection."

HISTORY AND PRESENT POSITION.

M. Frood, under this heading writes:—The existence of saltpetre in the kranzes, which form so notable a feature of the low mountain ranges of these districts, has probably been known from the early days of white settlement. So well known a substance could not have escaped observation long, and, being recognised, was certain soon to be put by the farmers to purposes of use or profit. It was undoubtedly so for many years prior to 1894, when a great, if rather short lived, boom period started, which attracted widespread interest to these deposits, and was the cause of much excitement throughout South Africa. For this boom, the late Dr. Hahn, of Capetown, was largely responsible, that gentleman having spent a considerable time in the district investigating the occurrences, upon the possibilities of which he subsequently reported in very sanguine terms. One result was the formation of an English company, with a large capital, to exploit the deposits with which object an extensive plant, including lixiviating and evaporating tanks, was shortly despatched to South Africa. This plant was ultimately erected on Buisvlei, but previous to this the company appears to have done a good deal of work on the neighbouring farm of Glen Allan. These farms, along with Waterside and parts of the Town Commonage of Prieska, appear to have constituted the principal holdings of this company. By this time, however, many other smaller companies and independent speculators had entered the field, and there is said not to have been a single farm in the district, on which there was the smallest prospect of nitrates, that was not held on contract or option. One of the most active workers was the late Charles Struben, whose operations were concentrated on certain farms in the neighbourhood of the village of Griquatown. In no case was any success achieved, and by the end of 1896 nearly all interest appears to have ceased. A good deal of energy must have been expended, and certainly much money was spent, but practically nothing remains to tell the tale. Differently perhaps from the Transvaal, when in the Cape a big speculative adventure ends in failure, it is not easy to resuscitate interest, and so Prieska Nitrates followed the same course as the Gold Fields of Prince Albert and Millwood, Karoo Coals, Cape Manganese, and Kuils River Tins. It was not, indeed, until quite recently, after the lapse of 25 years of almost complete inactivity, that more than a passing interest has been attracted to these deposits. In the meantime, a regular though inconsiderable output of saltpetre was maintained, at the instance mainly of farmers, by picking along the cliff faces, just as before the boom. Part of this output was appropriated to farm uses and part put upon the market. One enterprising Indian is stated to have done remarkably well in this business. Quite recently, according to information given me, two samples of nearly pure nitrate, each of about two tons weight, have been obtained in this way. In July, 1916, I paid a short visit to Prieska to make enquiries regarding a certain occurrence of nitrate in that neighbourhood. What I then had the opportunity of seeing did not impress me very greatly, but, as I have

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found later, I did not strike by any means the best or most interesting of the occurrences. Nevertheless, as the result of my enquiries, I came to the conclusion that there was a hope of profitable exploitation contained in the following elements, viz.: (a) High price of the salt, (b) surface deposits, small and scattered, are rich in places, (c) could be worked in many places in conjunction with asbestos; (d) by cheap unskilled labour, practically without supervision; (e) by a system of picking that would involve little other working expenses; (f) in comparative proximity to railway. On these lines I subsequently tried my best to interest Messrs. A. Boake, Roberts & Co., Ltd., of London, with a view to their co-operating in an effort to start an export trade to England on a small scale. Unfortunately, this firm, though at first apparently favourable, failed ultimately to find the scheme sufficiently attractive and dropped it. Shortly before this, Messrs. Ettman & Todd, of Prieska, who were interested in the question of a possible local nitrate production, had approached the Cape Explosives Company on the subject of whether the raw material that could be supplied from that district could be utilised in the manufacture of explosives. The reply of the company, which was to the effect that it could only utilise material similar to that of the samples submitted as a substitute for sodium nitrate and pay for it at a price of £8 10s. per ton, less costs of refining, put any business out of the question. The next development was the start of a local syndicate at Prieska, formed with the object of working certain deposits on the farm Spitzkop, about 19 miles distant from the town. A small plant was put down, and about five tons of nitrate were produced. Results, however, did not prove payable, as, indeed, was only to be expected in view of the small scale of operations and the many working difficulties. About this time, something over a year ago, the interest of the Consolidated Gold Fields of South Africa, Ltd., was attracted to the possibilities of the district, and one of their engineers was sent down to investigate. A number of the most promising nitrate propositions were inspected, and the reports were favourable; but, notwithstanding this, the corporation finally decided not to interest itself further. On failure to deal with the Consolidated Gold Fields, the local syndicate was glad to part with its interest to Colonel Langebrinck, who was anxious to acquire properties in the district. This gentleman in turn brought in Mr. Freeland, of Johannesburg, who spent a good deal of money in further investigation, but, as I have been informed, without being able to entirely satisfy himself. It was just then that Mr. Bleloch came in, and with him, later, the South African Nitrate and Potash Corporation, Ltd. The last company has, so far, only engaged in exploratory and experimental work, and is concentrating operations at present on the farm Prieska's Poort, about nine miles from the town of Prieska. According to the information given me, it has been able to secure mining contracts over nearly sixty farms, including most of the reputedly best nitrate propositions in the district. These farms are all within an area stretching from near Griquatown in the north to a few miles south of Prieska, and roughly, co-extensive laterally with the lower Griquatown beds, as shown on the geological sheet of the district. Following upon instructions from the Government Mining Engineer, I proceeded to Prieska, along with Mr. Hall, Assistant Director of the Geological Survey, on the 16th April, for the purpose of making further enquiry into the prospects of a nitrate industry being established in that district. We spent six full days there inspecting different properties, amongst which were Spitzkop (two visits), Prieska's Poort, Prieska Commonage, Glen Allan, and Kranzfontein in the neighbourhood of Prieska, and Mooipoort, Klippoort and Kloof in the neighbourhood of Niekerk's Hope, a village 27 miles north of Prieska. Naturally, much more time might have been spent in inspection, in view of there being so many occurrences of more or less interest, spread over so wide an area; but, from what we saw ourselves and from the information given to us, it was evident that, as regards the essential features we had in view, a few good examples might safely be taken as typical of the whole, and that to gather further details would simply be a waste of time. Amongst others who advised us to this effect was Mr. W. F. Bleloch, who at the same time referred us to Spitzkop, Kloof and Mooipoort, as perhaps the best and most interesting of his company's holdings. To these three farms we gave particular attention. One omission we did make and somewhat regret—which is that we failed to visit the farm Klipfontein, where good values in nitrate are reported to have been obtained from tunnels driven 35 feet and 45 feet respectively into the hill side, in connection with asbestos mining, as it might have been of some importance to note the conditions affecting these occurrences.

(To be continued.)

Zaaiplaats Tin.

The Zaaiplaats results for the month of September, 1919, are as follow:—Days run, 26 days; concentrates won, 12 tons; estimated loss for the month, excluding Government taxes and directors' fees, £962 6s. 5d.; capital expenditure, £191 6s. 5d.

Swaziland Tin.

The following are the results of the operations of this company for the month of September, 1919:—Concentrate recovered, 25 long tons; estimated profit (taking tin at £250 per ton), £918; add adjustments in respect of previous shipments, £838; total profit, £1,786.

The Lonely.

The following are particulars of output of gold, etc., from the Lonely Mine for the month of September, 1919:—Mill ran, 696 hours; crushed, 4,560 tons; fine gold recovered, 2,198·383 ozs., value £9,243 4s. 10d.; slimes treated, 4,560 tons; fine gold recovered, 3,884·303 ozs., value £16,332 6s. 8d.; total fine gold, 6,082·686 ozs.; total value, £25,575 11s. 6d.; profit, £14,159 4s. 6d.

S.-W. TRANSVAAL AUGUST'S DIAMOND RETURNS.

The diamond returns for August show that the South-Western Transvaal produced 7,182 carats, value £103,397; the average value per carat being £14 7s. 11d. The monthly totals for 1919 have been:

	Carats.	Value.		
January	3,385¾	£31,685	8	0
February	4,631½	41,968	8	6
March	5,431¼	54,166	0	0
April	5,530¾	59,261	7	6
May	5,964¾	68,473	10	9
June	5,116¾	63,863	10	0
July	6,384	86,922	0	0
August	7,182	103,397	0	0

The producing areas numbered 46, and were as follows:

BLOEMHOF DISTRICT.

	Carats.	*Value.*
Kameelkuil	1,816	£28,328
Bleshokfontein	1,094	15,542
London	283¼	4,266
Dievedraai	119¾	2,970
Schweizer Reneke	118¾	2,302
Bloemhof ...	163¼	2,265
Italie	313¾	2,120
Christiana	136¾	1,949
Vechtvallei	97	1,769
Bloemheuvel	101¾	1,708
Mooifontein	78	1,322
Eerstebegin	55	1,090
Plessisdam	93½	1,083
Naauwpoort	52¾	725
Klein Italie	17¼	326
Middelbosch	12	300
Mimosa	21¼	294
Grootdoorns	14	240
Zevenfontein	25¼	234
Cawood's Hope	16¾	232
Van Wijk's	11½	231
Goudplaats	13¼	196
Besjeslaagte	14½	154
Sandringham	15¾	152
Goedehoop	13¾	113
Rietput	5½	100
Outspanning	7	87
Zwartlaagte	6¾	60
Panfontein	6¼	58
Koppiesvlei	6½	53
Diamaantdoorns	6	49
Schoongezicht	6½	47
Maroetjesfontein	4¼	39
Kromellenboog	2¼	21
Van Zijl's Drift	1¾	11
Nooitgedacht	0½	5

POTCHEFSTROOM DISTRICT.

	Carats.	*Value.*
Eastleigh	44	£915

WOLMARANSSTAD DISTRICT.

	Carats.	*Value.*
Rietkuil	1,438¼	£16,898
Kareepan	534	8,325
Leeuwfontein	194	3,654
Syfergat	91	1,363
Doornbult	58¼	784
Klipkuil ...	29½	539
Holloway's Rust	34½	400
Katdoornkraal	5¼	70
Brandewijnskuil	1¼	8

Kareepan includes "Lavine's Prospect" and "Uitspan"; Klipkuil includes "Odendaal's Prospect" and "Uys' Rush."

COALING FACILITIES AT DURBAN.

A Detailed Description of the Bluff Installation—Coping with the Increased Coal Trade.

[*By Our Special Commissioner to the Natal Coal Fields.*]

The development of the Natal coal industry and particularly the expansion of the export and bunkering trades at Durban has called for improved coaling facilities at that port. The equipment existing there to-day has a maximum capacity of about 1,400 tons per hour, but when the railways are in a position to deliver more coal and satisfy the demands of shipping the present equipment will require considerable extension. Natal, which has the premier port of the Union, was the first of the South African states to discover coal (in 1838), and mining commenced in 1888. The Cape Colony commenced mining in 1865, the output then being 16,500 tons, which amount had increased in 1899 to 208,655 tons. The Cape Colony's output after that date has been comparatively insignificant as compared with that of Natal and the Transvaal, which latter commenced mining in 1893. The development of the coal industry has been and will continue to be most beneficial to Natal, as it will result in largely increasing traffic to the coast. Railway facilities to-day are much improved since the early days of the coal traffic, but there is a great dearth of rolling stock. In 1907 it took 90 hours for the coal to travel from the mines to the harbour, and to-day—with a greatly increased load—it can be conveyed in 70 hours. The importance of the coaling industry has never yet been fully and generally realised in South Africa, and the output has been greatly curtailed by lack of rolling stock on the railways. The advantages of having large supplies of coal available at Durban have been especially brought home during the war, but for various reasons the Port of Natal has never yet been able to reap the full benefit of its favoured situation in regard to its large up-country coal areas. Nevertheless, the progress of the port of Durban since the days of the Boer War has been most gratifying. In those days mail steamers and smaller craft lay outside the harbour, and cargo and passengers were unloaded thence into tugs and lighters. Now, the mail steamers and larger vessels come inside and are unloaded alongside the wharf. This enormous advance may be attributed partly to the great increase in the coal industry at the port. About the year 1905 it was found that the old methods of coaling, by means of baskets, were altogether inadequate; designs were therefore got out for a coaling plant, which was erected in 1907, and this plant has done excellent service during the last ten years. Before the erection of this first coal-loading plant the coal loaded annually at Durban amounted to 847,000 tons, but in ten years it had risen to more than double that amount. In 1913 it was decided that a new coaling plant was necessary, partly as an extension, and partly to take the place of the old one, should anything go wrong with it. Messrs. Fraser & Chalmers secured the contract for this new plant, and it was to have been erected in 1915, but, owing to the outbreak of war, and to Messrs. Fraser & Chalmers' premises being requisitioned by the Government, that was rendered impossible. In 1917, however, the plant was completed, and Messrs. Fraser & Chalmers are to be congratulated upon the excellent work achieved by this equipment. Through the courtesy of the local administration of the S.A. Railways and Harbours, your Special Commissioner was enabled to make an inspection of the coaling installation the other day, and the following descriptions of the plant should prove of interest. Generally speaking, the installations consist of four essential units: (a) The dumper, with which the coal trucks are discharged into a large concentrating pan. (b) An inclined belt conveyor, which receives the coal from this pan and elevates it up an incline to (c), a second band conveyor, which runs in an elevated gantry parallel to the quay-wall and which feeds, by means of a tripper, on to (d) a hinged telescopic band conveyor, which is mounted on a travelling tower and can be fed with coal in whatever position it may be, and discharge into the vessel.

(a) The Dumper is one of McMyler's well-known machines designed to handle 75-ton trucks (short tons), and to discharge them by tipping them over sideways into the large concentrating pan. The Dumper is controlled by three 150 h.p. Westinghouse motors, with the latest pattern contact or control gear. It is necessary to raise the coal at this point, not only because it was undesirable to excavate so near the water, but also in order to be able to feed from the concentrating pan to the existing coal-handling plant, and to provide the necessary energy for disposing of the empty trucks by gravity; to this end the rail-level of the tippler is about 12 feet above ground-level. The coal trucks are pushed up a ramp by means of a "pig." The normal position of this "pig" when not in use is in a pit between the rails of the track on which the coal arrives—so that the trucks can pass over it. The full trucks gravitate to a point just beyond, and there come to a standstill, at the foot of the ramp, frim which point they are handled by the "pig," which emerges from the pit and engages with the central buffer at the rear of the truck and pushes the latter up to the dumper. Immediately the truck arrives at the dumping platform the "pig" returns by gravity into its original position in the pit, ready for the next truck. After the coal has been tipped the now empty trucks run by gravity down the incline on the other side, to the sorting sidings. The dumper is capable of dealing with any size wagon up to 75 tons capacity, or it will accommodate two smaller ones at the same time equally well. The capacity has been kept on the high side in order to allow for delays which occasionally occur in the handling and marshalling of the trucks, and to bridge over such gaps in the continuity of the proceedings sufficient storage-room is allowed in the concentrating pan for about 150 tons of coal. The handling of the trucks does not therefore have to stop when the conveyor is held up for a few minutes when changing holds, or for other causes. In a lay-out of this kind it has been necessary to very carefully consider the sidings, so that the full trucks can be easily fed down to the tippler or dumper, and then led away to the empty sidings. The concentrating pan into which the coal is tipped is so arranged that it may either feed on to the inclined belt or into tubs standing on trucks which are running on the bucket car line, underneath the concentrating pan. These tubs are of special construction to be handled by an existing coaling plant, and consist of skips holding about 7 tons to 8 tons of coal. Six of these can be automatically and simultaneously filled by means of valves which have been arranged at the six corresponding outlets from the concentrating pan. These valves are all opened simultaneously by a motor, and the coal is allowed to flow until the trucks are full, when all valves are again closed by the motor, being so arranged that they cannot overfill the skips. When the coal is fed on to the conveyor this is done without the employment of any of the usual feeding devices, as Messrs. Fraser & Chalmers have found, from experience gained with other plants, that a properly designed feeding shoot will feed the coal sweetly down to the belt without overloading it, and without any necessity for an automatic feeder of any kind.

(b) The Inclined Belt, known as conveyor No. 1, which is about 230 feet long, from centre to centre of terminals, and 48 inches wide, takes the coal from the concentrating pan to an intermediate tower, up an incline of 20 degrees. It is carried on a bridge entirely enclosed and provided with a footwalk on each side of the belt, the driving gear being at the head end, and a 65-h.p. motor is provided for this. A set of troughing and return idlers is used for these band conveyors; they are fitted with ball bearings throughout. The belt itself is a 10-ply composite rubber-canvas one, with 3-16 inch thickness of pure rubber on the working side. At the intermediate tower the coal is discharged into a three-way shoot, from which it can by manipulation of the valves—be fed either direct to the travelling tower, if it should happen to stand in this position, or to conveyor No. 2, which runs parallel to the quay-front, while a third outlet is provided in order that the coal may be fed to a similar conveyor, the erection of which is contemplated as a future extension, and which is to run to the opposite side to the one already in use.

(c) The Tripper Conveyor, running along parallel to the quay-wall, is known as conveyor No. 2, and is provided with a tripper, through which it discharges the coal to the receiving hopper of the travelling tower in whichever position the latter may be. The tripper conveyor is about 525 feet long, and also 48 inches wide, and is driven at the head-end by another 65-h.p. motor. If the tripper has to be moved to a fresh position it can be travelled along the bridge or gantry by the conveyor belt itself, but in addition to this it is also provided with an auxiliary hand-travelling gear, so that it can be moved if the belt is not running. One feature of the tripper is that it is automatically locked during the time it is discharging coal. The upper part of the gantry forming the protection for the tripper belt is, on the side next the tower, only closed in for a portion of its depth below the roof, the lower part forming a slot-like opening interrupted only by the stanchions by which the roof is supported.

(d) The Travelling Tower. The principal object of this is to support a telescopic-hinged belt conveyor which has a wide range of movement. The shortest length of the band from the supporting trunnion to the centre of the head pulley is 55 feet, and when racked out to the uttermost it is 77 feet. The conveyor is capable of discharging coal at a maximum height of 50 feet above the quay level, or a total height of 60 feet above the water-line. It can also be adapted, by its telescopic movement, to deliver at a distance varying from 8 feet to 30 feet from the edge of the quay-wall, so that it is capable of coaling any size of vessel calling at the port. This great flexibility, which is a special feature, is obtained by making the conveyor both luffing and telescopic, so that by a combination of these two facilities the discharging terminal can be placed in any position required within the limits mentioned. The conveyor can either feed direct into the ship or can discharge by way of the telescopic anti-breakage shoot which is provided, and which is supported by the large box-lattice shear-legs which form a part of the tower. The shoot is lowered into the hold of the vessel until the lower end reaches to the bottom, the coal is then fed in at the top until the shoot is full, when the shoot is gradually raised to allow the coal in it to pass out at the same rate at which it is fed in at the top of the conveyor; in this way the coal can be lowered without a drop, whereby breakage is avoided. It may be mentioned that as the South African coal is particularly friable, special care was taken in the construction of this plant to eliminate any undue breakage of the coal by avoiding as much as possible any direct fall at the points of transference. The whole tower, which weighs approximately 150 tons, is arranged to travel along the quay front on two double rail tracks, 43 feet, 6 inches apart, at the rate of 80 feet per minute, and the telescopic and luffing motion of the conveyor and the telescopic and luffing motion of the anti-breakage shoot are so arranged that they can be operated in a minimum of time, so that it is possible, for instance, for the man in charge, after completing coaling at one hold, to withdraw the shoot and conveyor and move the whole apparatus along to the new position, and start coaling again at the next hold with a waste of time of only about 2½ minutes to 3 minutes. These quick movements are only possible because the whole plant is controlled by one man, who has his stand in the cabin at the top of the travelling tower, from which point of vantage he can closely watch and adjust all operations. All the master controllers which operate the two main belts, Nos. 1 and 2, and the telescopic belt, are placed in this cabin, as well as those of the luffing and telescopic motions of the belt conveyor, and the anti-breakage shoot in the tower, and all movements of the tower itself. As this one man has all these motions under his control, he is able to combine them in such a way that no time is lost and that accidents are extremely unlikely. All motions on the tower are controlled by seven electric motors. These include: traversing motor, 30-h.p.; conveyor drive motor, 30-h.p.; conveyor telescoping motor, 10-h.p.; conveyor luffing motor, 40-h.p.; shoot telescoping motor, 6-h.p.; shoot hoisting motor, 25-h.p.; jib luffing motor, 40-h.p. With this method of driving all telephones and signal-belts, etc., which play an important part in some older installations, can be entirely dispensed with. The coal-dumping plant is also under the control of one man, so that these two drivers are the only two skilled men that it is necessary to have about the place. As far as the dumper is concerned, all that the driver has to do is to keep a constant supply of coal in the pan, and there is no need for any form of signalling, with its inherent dangers, throughout the plant. All movements are provided with automatic cut-outs, so that the whole plant stops the moment anything goes wrong. In addition to this provision, there are emergency push-button cut-outs arranged at intervals along all gantries or bridges, and at different points on the tower, so that if an accident should occur through any cause the whole plant can be immediately stopped by the use of any one of these push-buttons. This special feature in the complete electrical control of the plant is one of the chief developments in this latest coaling installation, as it not only reduces the running of an otherwise complicated plant to a very simple business, but it also saves labour expenses, which matter is equally essential to the commercial success of the plant. The requirements laid down by the South African Government were that the plant should be capable of loading coal on board at any rate of speed between 200 tons and 600 tons per hour, but it is actually capable of dealing with 200 to 1,000 tons per hour as a normal load, and if at all pushed, can easily carry more than the 1,000 tons, provided external conditions are

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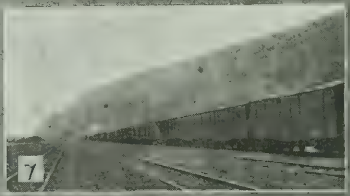

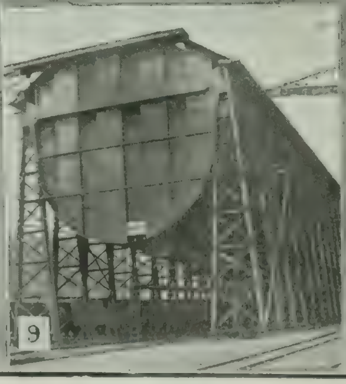

(1) Coaling a Ship at the Bluff.
(2) Steamers in Durban Harbour awaiting coal, October, 1919.
(3) General view of the Mechanical Coaling Plant, Durban.
(4) Coaling an Eastern Bound Ship
(5) Another View of the Plant at Work.
(6) Coal Transport and Bin at the Bluff Durban.
(7) A Coal Train at the Bluff.
(8) Coaling a Steamer bound for Singapore at Durban.
(9) The Storage Bin at the Bluff, capacity 10,000 tons of coal.

favourable, [illegible] the supply of trucks in quick succession and the necessary trimming of the vessel. The rate of travel of the belt when dealing with 200 tons per hour is 120 feet per minute, and when dealing with 1,000 tons it is 600 feet per minute. The requirement that the tonnage carried over the belt should be varied was specified so that the coal should be fed at a low speed when discharging to side or head ports, and at the maximum speed, if desirable, when loading into open hatches, or at any speed between the minimum and maximum limit at the discretion of the driver on the tower, who can see exactly how much coal can be taken, and increase or decrease the speed at which it is fed to the boat according to circumstances. These requirements were happily met by varying the speed of the conveyor belts, instead of depending on the opening or shutting of regulating valves, which could not well be controlled from a central point, and would therefore necessitate the employment of additional labour, signalling, and other complications. The plan adopted also allows the belt to run at its full load all the whole, whatever the capacity of the plant at that particular time, which, of course, is the most economical arrangement for the life of the belt. The 500-volt direct-current electrical current is conveyed to the various motors by means of a series of trolley wires, which are attached to the structures supporting the conveyor belts, and which feed to and from the tower by trolley collectors. The whole plant can be lit up, and is therefore capable of working at night, the current for the lighting being 200 volts alternating current. The total horse-power on this plant is about 781. Great care has been taken in the design of the plant, so that any part of the machinery on the tower or elsewhere can be taken out and lowered to the ground for repairs in the shortest possible time. All winches, both for the dumper and other machinery houses, are provided with runways over them for the accommodation of blocks and tackle, which will always be available for hoisting any part of the plant from its position and lowering it on to railway trucks in case of any repairs being necessary. The telescopic shoot of the tower is also so designed that it can be placed on a railway truck running on the rails under the tower. Both the main belts are driven by single terminal driving drums, in preference to the tandem driving pulleys favoured by some engineers, and the peculiar arrangement of the idlers of the return band close to the driving terminal will give to the drum the necessary grip on the band without its being necessary to employ these so-called tandem driving pulleys. The coal, as it passes over the main tripper belt, No. 2, is automatically weighed by a Merrick weighing machine, so that an accurate account can be kept of the amount of coal loaded. The plant was designed and manufactured at the Erith Works of Messrs. Fraser & Chalmers, Ltd., and erected at Durban by one of their engineers, who went specially for the purpose to South Africa. About two-thirds of all the coal dealt with to-day at Durban is handled by this plant at the Bluff, the remainder being dealt with by the antiquated basket system at the Point.

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IMPORTANT NEW WORKS AUTHORISED DURING JULY, 1919.

South Coast Line. Strengthening and Extension of Umbogintwini Bridge.
Pankop Railway.—Strengthening of track with additional sleepers.
Naauwpoort.—Alterations to station yard.
Glencoe-Vryheid.—Construction of a telegraph line between.
Table Bay.—Provision of cold storage accommodation in Union-Castle Company's Building.
Durban.—Installation of Gamewell Fire Alarm system in Point Area. Extension of electric transforming and distributing plant. Provision and installation of new machinery.
Burghersdorp.—Provision of four new houses for running staff.
Bethlehem.—Provision of four new houses.
Kroonstad. Provision of four new houses.
Bloemfontein.—Provision of ten new houses.
Beaufort West.—Installation of electric light.
Arundel.—Improvement to water supply.
Pretoria.—Extension of electric generating and distribution plant. Provision and installation of new machinery.
Salt River.—Equipment of new erecting shop. Provision and installation of new machinery.
Pietermaritzburg.—Provision and installation of new machinery.
East London.—Provision and installation of new machinery.
Uitenhage.—Provision and installation of new machinery.
All Systems.—Preliminary expenditure in connection with provision of grain elevators.

Ancient Mining.

In his reply to the discussion on his paper on the "Ancient Tin Mines of the Transvaal," Mr. Baumann mentioned some interesting theories with regard to discoveries made in the ancient workings at Weynek. A correspondent has informed him that small earthenware lamps have been discovered resembling in size and shape the truncated spherical coffee cups used in S.A.R. dining cars. It is stated these lamps contained wicks of fibrous monkey tail. If correct, this points to the workings having been of quite recent date, contrary to Theal's statement that the Bantus were not acquainted with lamps. The word "ancient," as applied to mine workings in South Africa, refers to those before the dawn of history. Herodotus mentions a Phoenician expendition round Africa in 610 B.C., but the first written record of Africa, south of the Zambesi, is that of an Arabian, Massoude, about 915 A.D. Several writers, including Hall, Theal and Livingstone, regard the ancients as probably Semitic, the term Semitic including not only Jews but Arabs, Phoenicians and Tyrians. Theal gives numerous references to show there was extensive mining in the interior from 915 to 1750 A.D. One of the earliest accounts of the East Coast of Africa is in the "Pesiphus of the Erythrean Sea," about 80 B.C., which mentions Rhapta, now Kilwa, as a dependency of Yemen or Saba, in South Arabia. There is a tradition that the gold of Solomon's Temple was obtained from Rhodesia. During Van Riebeek's administration, the Dutch East India Company sent an expedition from the Cape to look for these traditional mines. After quoting numerous African historical writers to support his contentions, Mr. Baumann thinks that the ancient tin mines were contemporaneous with the ancient copper mines of Northern Transvaal and the ancient gold mines and the ruins in Rhodesia; that the mines were worked by, through or under the direction of a Semitic race, who entered into Africa from Southern Arabia; that there was a slight amount of sporadic mining up to quite recent times by the Bantu, but that the bulk of the ore was extracted at some period antecedent to the rise of Mohammed (600 A.D.).

THE FAR EAST RAND:

Its Reefs, Mines and Share Values, by W. E. Bleloch.

A Critical Review.

Mr. W. E. Bleloch's latest book, "The Far East Rand. Its Reefs, Mines and Share Values," makes its appearance at an opportune time. Each month witnesses a further expansion in the development of this vast annexe of the old-time Rand. The premium which is now being obtained for our gold greatly enhances the value of the rich mines of this section of our gold fields, share values are rising, and it is safe to say that at no other period in the history of the gold mining industry has so much attention been bestowed on the Far East Rand as at present. For these reasons then, if for no other, Mr. Bleloch's interesting compilation, which contains a characteristically virile "Essay on the National Importance of Far East Rand Gold" by Mr. A. E. O'Flaherty, an introduction to mining data by Mr. C. J. Tutt, with maps, photographs and several pages of calculations as to tonnage, gold contents, etc., will claim many deeply-interested readers. It is also safe to say that it will find innumerable critics, for Mr. Bleloch's well-produced volume is much more than a description of Far East Rand mining propositions; it involves many questions of deep financial and national importance, as well as of geology. Readers of this journal are probably well aware of the essential principles of Mr. Bleloch's stratigraphy. Only a few months ago this paper contained a series of exhaustive articles under the heading of the "Greater Heidelberg Gold Fields," which examined the contentions of the rival schools of geological thought at great length and dealt with the various undertakings founded on the three-reef theory as opposed to the one payable ore body doctrine of the orthodox geologists. Mr. Bleloch stands for the belief that Nigel, Van Ryn and Main Reef are three separate ore bodies. These, he would have us believe, are the three Graces of the Transvaal mining industry, and the greatest of these is the Van Ryn. It is almost permissible to suggest that the author of this entertaining work is inclined to regard the other two reef bodies as disgraces rather than graces, for early in the volume we are informed that seven of the leading Main Reef companies have depreciated in market valuation by over fifty-one millions of money during the past few years, and throughout the work it is clear that Mr. Bleloch considers the Nigel Reef to be of very small account by comparison with the Van Ryn ore body. We do not propose to re-examine the geological evidence of the controversy, but we might point out that whereas we considered the various new flotations to the south and south-east of Daggafontein under the heading of "The Greater Heidelberg Gold Fields," the author of the volume here under review discusses them under the title of "the Far East Rand." Even the very title of the book, considered in conjunction with the scope of its enquiry, makes it patent that Mr. Bleloch is looking for trouble. Only the other day Dr. Mellor, in dealing with Mr. Bleloch's remarks at the last meeting of the E.R.P.M., objected to the loose application of the entrancing term "Far East Rand" to areas which were not established as being correlative with the great Modder group of mines from the point of view of proved gold contents and payability. But Mr. Bleloch and his colleagues are openly antagonistic to the teachings of the orthodox academy, and it is quite clear that "The Far East Rand, Its Reefs, Mines and Share Values" is issued as a further challenge to the ways of the Big Houses, and particularly to the financial methods and geology of these Big Houses. Mr. Bleloch, for instance, deals with the somewhat mystifying cables which recently appeared in the Press on the subject of the alleged deal between the Central Mining and Investment Corporation and the Sauer-Bleloch interests in the Heidelberg district—an "alleged deal" which was subsequently officially denied. He recognises the "fear that the opening up" of the new outcrop areas will put an end to the "monopoly of Rand mining finance," and adduces this as the cardinal factor in the aloofness of the large corporations towards Heidelberg Mr. Bleloch's collaborator in "For Us or Germany?" Mr. A. E. O'Flaherty goes deeper into the conspiracy. Mr. A. E. O'Flaherty, observes sinister happenings in the disposal of Rand gold at a premium through Messrs. Rothschild to "India" and elsewhere. "India" is evidently to Mr. O'Flaherty a vague term behind which may lurk all manner of international intrigues and perils. The authors of "A Thousand Millions" evidently think that the Boche, although defeated in battle, is still capable of wreaking untold mischief through international financiers and other subtle media. Probably he is, for the Hun has lost none of his cunning since the Armistice. But to imagine that Dr. Mellor and Mr. Clifford and various other geologists will not recognise an egg-shaped pebble when they see it because of German views in regard to the influence of mottled grey quartzite enclosures on "weld-politik" is, we fancy, going a little too far into the realms of phantasy. For all that, there is much in Mr. Bleloch's book apart from petrology which is worthy of serious thought. He says: "To my mind the great load of debt now laid on the Old Country is too heavy for its resources—great as they are—to bear. It is absolutely essential that the base of the industrial and financial structure should be broadened, and this can only be done by securing ground floor and controlling interests in such enterprises as the southern areas of the Far East Rand gold field present." We quite agree—provided that these areas warrant the acquisition of such interests. But do they? No journal would welcome such proof more heartily than we would. But at present there is very little that is definite to go on. We still await the results of development at the Southern Van Ryn, where Mr. Bleloch has had good opportunity for some months past to demonstrate the economic proof of his assertions. And it is the economic side of the question that we are mostly concerned with. If Mr. Bleloch, or anybody else for that matter, can convince us that an independent mine of proven payability is being smothered by mysterious alien interests, he can rest assured that he will find in the *S.A. Mining and Engineering Journal* a ready champion of his persecuted interests. But we want the proof. It is not enough to tell us that the Southern Van Ryn will yield a total profit of twenty-three and a third million pounds and to state that each Southern Van Ryn share will give a gross return of £68 for each pound invested at present Johannesburg price. It is here that we feel bound to criticise Mr. Bleloch's calculations. The Nigel-Van Ryn has only 12,000 tons of ore developed, but from this it is calculated that this mine will yield £2,709,375 and give a gross profit of £1,434,375. Similarly New State Areas are reckoned to yield a nett profit of ten and a half millions, Lace Props £15,000,000, Spaarwater £17,000,000, Houtpoort £9,250,000, Eastern Van Ryn £13,300,000, and Boschfontein £10,000,000. These companies possess no ore reserves whatever, and it is difficult to understand what Mr. Bleloch and his colleagues base their computations on except on vague "jewel box" factors, such as contiguity to other mines and the returns of such mines or the average returns of groups of mines. This is unsound and dangerous practice. With infinitely more data to work on, the people who Mr. Bleloch opposes let it be known to the world at large that Crown Mines and East Rand Proprietaries were the consols of the mining world, and at an annual meeting the chairman of the French Rand told shareholders they possessed one of the finest properties on these fields. The Corner House has had to pay the cost for those outbursts of unjustified optimism in reputation if not in cash. The House has had to work hard, to delve in silence and reap in results, not prophecies, in an endeavour to redeem its name. It has brought the Modder East to a successful stage without any of the old fanfares and financial hysterics. Let Mr. Bleloch do likewise and we will be less harsh with our cudgels.

O. L.

The South African Railways and Harbours notify for general information that the following tender has been accepted:—Contract No. 1) Messrs. Wade & Dorman, New Steel Foundry, Pretoria: Steelwork, £14,565; erection, £2,250; total, £16,815.

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THE SEPTEMBER GOLD OUTPUT IN DETAIL.

A Decrease of 8,111 Ozs. Owing to Shortage of Native Labour.

During the past month the Transvaal mines produced 698,558 ounces of find gold, a decrease of 8,111 ounces compared with the longer month of August. The totals as announced by the Chamber of Mines are as follows:—

WITWATERSRAND

	Ozs.	Value.
August	686,717	£2,916,988
September	680,359	2,889,980
Decrease	6,358	27,008

OUTSIDE DISTRICTS.

August	19,952	84,751
September	18,199	77,307
Decrease	1,753	7,444

GRAND TOTAL.

August	706,669	3,001,739
September	698,558	2,967,287
Decrease	8,111	34,452

The values mentioned do not include the increased price now being obtained under the new arrangement for the free disposal of gold. A premium of approximately 16 per cent. has been realised on gold shipped since July 25. The following companies increased their output in September: Crown Mines, £7,169; Springs Mines, £6,567; City and Suburban, £4,171; Government Areas, £4,116; Simmer and Jack, £3,950; City Deep, £3,614; Modder Deep, £3,220; Randfontein Central, £2,893; Roodepoort United, £2,630; Modder B., £2,413; Simmer Deep, £1,555; Jupiter, £1,777; Wolhuter, £1,152. The principal decreases are: Brakpan Mines, £11,528; New Modderfontein, £8,686; Knight Central, £6,449; Knights Deep, £5,110; Durban Deep, £4,851; Geldenhuis Deep, £4,664; Wit. Deep, £3,131; E.R.P.M., £3,003.

STAMP POSITION.

The following are the official figures regarding the stamp position:—

	Rand.	Outside.	Total.
August	7,884	295	8,134
September	7,899	285	8,184
Increase	55		5
Decrease		10	

NATIVE LABOUR.

The native labour figures for the past three months are as follow:—

	July.	August.	Sept.
On gold mines	173,613	170,844	169,120
On coal mines	12,543	12,450	12,392
On diamond mines	5,736	5,655	5,294
	191,802	188,949	186,806

COMPANY RETURNS.

WITWATERSRAND.

	Value. £	Increase. £	Decrease. £
Aurora West	15,122	—	1,457
Bantjes	446	—	317
Brakpan	77,755	—	11,528
City and Suburban	31,199	4,171	—
City Deep	106,932	3,614	—
Cons. Langlaagte	53,721	—	119
Cons. Main Reef	72,955	—	2,315
Crown Mines	247,668	7,169	—
Durban Deep	28,099	—	4,851
East Rand Proprietary	150,391	—	3,003
Ferreira Deep	48,603	—	2,964
Geduld Proprietary	64,523	—	391
Geldenhuis Deep	51,652	—	4,664
Government Areas	201,742	4,116	—
Jupiter	27,309	1,177	—
Knight Central	25,350	—	6,449
Knights Deep	69,565	—	5,110
Luipaardsvlei	19,030	—	1,410
Langlaagte Estate	48,777	174	—
Meyer and Charlton	40,523	—	1,126
Modder B.	117,127	2,413	—
Modder Deep	94,920	3,220	—
New Goch	12,399	—	234
New Heriot	14,765	204	—
New Kleinfontein	66,333	—	4,188
New Modder	153,568	—	8,686
New Primrose	17,131		951
New Unified	11,673	—	293
Nourse Mines	48,042	—	2,111
Princess	25,966	—	1,942
Randfontein Central	174,378	2,893	—
Robinson	42,116	—	268
Robinson Deep	76,748	—	1,223
Roodepoort United	23,520	2,630	—
Rose Deep	58,857	—	1,767
Simmer and Jack	62,165	3,950	—
Simmer Deep	51,971	1,555	—
Springs Mines	72,339	6,567	—
Van Ryn Estate	32,856	416	—
Van Ryn Deep	110,483	645	—
Village Main Reef	24,972	—	107
Village Deep	62,437	—	2,171
West Rand Consolidated	38,722	—	157
Witwatersrand	37,733	—	769
Wit. Deep	32,512	—	3,131
Wolhuter	35,983	1,152	—
Miscellaneous	8,902	628	—

OUTSIDE DISTRICTS.

T.G.M.E.	24,000		2,378
Glynn's Lydenburg	4,698	—	773
Sub Nigel	26,425	—	1,487
Barrett	917	199	—
Miscellaneous	21,267	—	3,005

GROUP PROFITS.

	July.	August.	Sept.
Central Mining	£267,893	£254,647	£251,444
Barnato	194,398	170,255	176,018
Gold Fields	26,166	17,457	20,077
General Mining	25,130	20,997	25,861
Mines Selection	41,003	40,442	40,634
Union Corporation	77,881	72,172	73,403
	£632,471	£575,970	£587,467

MONTHLY RETURNS.

	1918. Ozs.	1919. Ozs.
January	714,182	676,059
February	659,759	636,728
March	696,281	712,379
April	717,099	694,944
May	741,317	724,995
June	727,696	702,379
July	736,199	725,497
August	740,210	706,669
September	708,200	698,558

Latest Company Registrations.

LIST OF COMPANIES REGISTERED IN AUGUST, 1919.

Pretoria Marble Co., Ltd., Alexandra Buildings, Pretoria; capital, £10,000.
Goldberg and Zeffertt, Ltd., 6, Van Beek Street, Doornfontein, Johannesburg; capital, £30,000.
Sherwood and Smulian, Ltd., Bunny Buildings (opposite Hotel Cecil), Rothsay Street, Benoni; capital £15,000.
Allen Wack and Shepherd, Ltd., Barsdorf Buildings, Ground Floor, Marshall Square, Johannesburg; capital, £675,000.
The Waterberg Transport Co., Ltd., 222, St. Andries Street, Pretoria; capital, £5,000.
Chohan, Ltd., 29, Ferreira Street, Johannesburg; capital, £500.
Burne and Henry, Ltd., 120, Fox Street, Johannesburg; capital, £150.
T'Sama Gold Mines, Ltd., 97a, Commissioner Street, Johannesburg; capital, £45,000.
R. G. McKowen and Radford, Ltd., 115, Main Street, Johannesburg; capital, £10,000.
The Reef Trading Co., Ltd., Third Street, Springs; capital, £500.
Standerton-Bethal Centrale Dingaansfeest Genootschap, offices of Bekker and Swemmer, Burger Street, Standerton; capital, £2,000.
The Rhodesian Timber Syndicate, Ltd., 119 and 120, Stock Exchange Buildings, Fox Street, Johannesburg; capital, £500.
Southern Estate Fruit, Ltd., 29, Ferreira Street, Johannesburg; capital, £200.
Barimar (S.A.), Ltd., First Floor, Barsdorf's Buildings, Marshall Street, Johannesburg; capital, £5,200.
Diamonds Deeps, Ltd., 55, Princes Street, Troyeville, Johannesburg; capital £3,500.
A. L. Darling (S.A.), Ltd., 40, Moseley Buildings, President Street, Johannesburg; capital, £5,000.
W. R. Levin Hides, Ltd., 64, Standard Bank Chambers, Commissioner Street, Johannesburg; capital, £25,000.
Transvaal General Engineering, Ltd., 73, Jeppe Street, Newtown, Johannesburg; capital, £1,000.
The United Baking Co., Ltd., 61, Pretorius Street, Pretoria; capital, £1,000.
Gemsbok Beperk, 29, Erasmus Buildings, Church Square, Pretoria; capital, £1,000.
Thornhill Trading Co., Ltd., 280, Church Square, Pretoria; capital, £500.
Celliery Trading Stores, Ltd., 49 and 50, Permanent Buildings, Harrison Street, Johannesburg; capital, £1,000.
Poppers Bioscope Cafes, Ltd., Moseley Buildings, President Street, Johannesburg; capital, £3,000.
Phoenix Foundry, Ltd., 83, Hay Street, Ophirton, Johannesburg; capital, £10,000.
Carter Brothers and Co., Ltd., 15, Macdonald Street, Jeppes Extension, Johannesburg; capital, £2,000.
Harris Miller and Co., Ltd., 4 and 4a, Cullinan Buildings, Simmonds Street, Johannesburg; capital, £10,000.
The Kleinkramer Co., Ltd., 5, 6, 7, and 8, Royal Chambers, corner Fox and Simmonds Street, Johannesburg; capital, £2,000.
S. Fisher and Simmonds (East Africa), Ltd., 110, Marshall Street, Johannesburg; capital, £15,000.
J. and R. Niven, Ltd., Barsdorf's Buildings, Marshall Street, Johannesburg; capital, £20,000.

FOREIGN COMPANY.

Victory Diamonds, Ltd., care of M. Edmund, care of L. Charlston Goch and Co., Exploration Buildings, Johannesburg; capital, £60,000.

ALTERATION AND ADDITION TO FOREIGN COMPANY.

Suidafrikaanse Nasionale Trust en Assuransie Maatskappij, Beperk, Johannesburg.

PROSPECTUSES.

Woollens, Ltd., Johannesburg.
United National Association of Commerce and Industry, Ltd., Johannesburg.
Die Wolmaransstad Boere Handelshuis, Beperk, Wolmaransstad.

SPECIAL AND EXTRAORDINARY RESOLUTIONS.

Central India Estate, Ltd., Johannesburg; alteration of Articles.
The Johannesburg Motor Mart, Ltd., Johannesburg; alteration of Articles.
The Rand Mutual Assurance Co., Ltd., Johannesburg; alteration of Objects.
Modderfontein Deep Levels, Johannesburg; division of shares.
Smiths Nurseries, Ltd., Johannesburg; Bond.
Transvalia Land Exploration and Mining Co., Ltd., Pretoria; alteration of Articles.
Chisholm Stevenson and Co., Ltd., Johannesburg; alteration of Articles.
Pelucine Chemical Industries, Ltd., Johannesburg; destruction of books.

NOTICE OF CHANGE OF NAME.

Koopasami, Ltd., Johannesburg, to M. M. Chunara and Son, Ltd.

NOTICES OF INCREASES AND DECREASE OF CAPTAL.

Union Mica and Corundum Mines, Ltd., Johannesburg; increased from £10,000 to £14,000.
Armistice Syndicate, Ltd., Johannesburg; increased from £12,500 to £15,000.
Carim Amod Estate Co., Standerton; increased from £600 to £1,500.
Woollens, Ltd., Johannesburg; increased from £40,000 to £100,000.
Standard Motor Works, Ltd., Pretoria; increased from £2,525 to £10,000.
Rand Retreading and Vulcanizing Co., Ltd., Johannesburg; increased from £12,000 to £15,000.
Rand Steam Matzos Factory, Ltd., Johannesburg; increased from £2,000 to £4,000.
Crystallizers, Ltd., Johannesburg; increased from £300 to £3,000.
Lace Proprietary Mines, Ltd., Johannesburg; increased from £255,000 to £382,000.

COMPANIES PLACED IN LIQUIDATION.

The Cape Ham and Bacon Co., Ltd., Johannesburg; by order of Court.
S. Hirschman and Co., Ltd., Johannesburg; voluntary.
Union Brick Co., Ltd., Pretoria; voluntary.

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PERSONAL.

Major J. R. Leisk, C.M.G., has joined the Boards of the "C.M.S." Subsidiaries.

* * * *

Mr. H. S. Harger, the well-known diamond expert, has returned to Johannesburg and resumed practice at Exploration Buildings as a consulting engineer.

* * * *

Mr. F. O. Stephensen, formerly Manager of Head, Wrightson, and Co., Limited, here, has again taken up his permanent residence on the Rand, in the same capacity.

* * * *

The list of certificates issued by the Mines Department for the fortnight for the period ended 15th October, 1919, is as follows:—Mine Managers (Metalliferous Mines): G. A. Davenport, R. B. Gascoyne, W. D. McClure, W. T. Mole, J. V. Muller, W. Tarran; (Collieries) W. Jones, D. Marshall; (non-fiery mines only) D. H. Colman.

Witwatersrand Deep.

The following are the results of operations at the Wit. Deep for the month of September, 1919:—Tons milled, 27,240; running time, 24½ days; gold recovered, 7,654 fine ozs.; working revenue, £32,620, or 24s. per ton; working costs, £36,075, or 26s. 6d. per ton; working loss, £3,455, or 2s. 6d. per ton. The published results do not include the increased price now being obtained under the new arrangement for the free disposal of the gold shipped since 25th July last. The gold so far sold is equal to slightly under one month's output of the Witwatersrand and has realised a premium of approximately 16 per cent. Any increased profit obtained by the company will be published quarterly after the receipt of account sales. The London secretary has written confirming the above premium. General remarks: The loss is chiefly due to the shortage of native labour. This company's percentage of underground complement is under the average of the Witwatersrand mines, the figures at 30th September being 63·39 per cent. as against an average of 67·59 per cent.

THE WEEK IN THE SHAREMARKET.

The Boom in the Sharemarket—Strong and Active with a Broadening Tendency—London Buying Largely.

THE long-hoped-for boom in the market manifested itself this week, and brokers have been reaping a rich harvest of orders. For the moment, labour troubles do not obtrude and only the bright features of the position are remembered. According to the cables, Kaffirs have ousted even the ever-popular oil shares in public favour, and the scenes in London recall the great boom days of times gone by. Better still, the cables all bring substantial buying orders, and once the people on the other side get going all our exact calculations of intrinsic values as conditioned by ore reserves and the rest may be disregarded as the criteria of prices. Already some Rand quotations are as high as their merits justify, but that is not likely to deter people oversea from getting in. At a time like this when the buying fever is abroad, a note of warning may be struck. The papers can always find reasons for a boom; the average pressman is always on the side of the optimists; but few of us have the heart to warn people against being carried away by the excitement of the moment. The fluctuations of the week are so many and so considerable, that we must leave them to speak for themselves in the following comparative list:—

	Fri., 10th.	Sat., 11th.	Mon., 13th.	Tues., 14th.	Wed., 15th.	Thurs., 16th.
African Farms	15 0	15 9	14 0	15 3	15 0	14 9
Anglo-Americans	31 9	31 3	32 0	33 0	33 6	33 3
Apex Mines	7 6	—	7 6	7 6	7 6	7 6
Aurora Wests	9 0†	9 0†	8 0†	8 0*	8 0*	—
African & European Inv.	—	—		17 0*	17 6	
Bantjes Cons.	3 0*	3 0*	3 0	3 3	3 6	3 9
Brakpans	70 0	—	72 0	72 6	75 0	74 0*
Breyten Collieries	—	—		8 0*	8 0	8 0
Brick and Potteries	—	—		4 6	4 6*	4 0
British South Africa	20 0*	—	20 0*	21 0*	21 0*	22 6
Bushveld Tins	2 1	2 0*	2 1	2 1	2 3	2 1
Cinderella Cons.	—	—	4 6*	5 0*	5 0*	5 6*
City and Suburbans	8 0	8 0	9 6	9 4	9 9	9 3*
City Deeps	61 6	62 6	64 6*	65 0*	66 0	67 0
Clydesdale Collieries	28 0	28 0	28 3*	28 3*	28 6	28 3*
Cons. Investment	—		30 0*	30 0*	32 6*	33 6*
Cons. Langlaagtes	20 6*	20 0*	21 6	22 6*	24 0	24 3*
Cons. Main Reefs	11 3*	11 3*	11 9	12 9	13 0	13 9
Cons. Mines Selection	27 0	26 9*	27 9†	28 3	28 0	28 6†
Coronation Freeholds	2 2	2 2	2 2	2 3	2 1*	2 1
Coronation Syndicates	4 0*	—	5 0*	5 0*	—	—
Crown Diamonds	10 6*	10 3*	10 6	10 3	10 3	10 0
Crown Mines	63 6*	64 6*	68 0	69 0	72 0	70 0A
Crown Mines Debentures	—	£102*	£102*	£102*	£102*	£102*
Cons. Gold Fields	—	—	41 0*	—	42 6*	42 6*
Daggafonteins	23 6	23 6	23 9	24 0	24 6	25 0
Do. Options	—	7 0*	7 0	7 0	7 3	8 0
Durban Rood. Deeps	9 6*	9 6	10 0†	8 0*	10 0†	10 0†
East Rand Coals	2 7*	2 8*	2 9*	3 1	3 4	3 3
East Rand Deeps	1 0*	1 0*	1 1*	1 6	—	1 6
East Rand Props.	6 0	6 4*	7 9	8 [illegible]	9 3	9 7
East Rand Debentures	£65*	£65*	£66*	£66*	£65*	£65*
Eastern Golds	1 6*	1 7*	1 9	2 0	2 0	2 0
Frank Smith Diamonds	6 6	6 6	7 0	7 0	7 3	7 3
Geduld Props.	56 6	56 0	59 6	60 [illegible]	63 6	63 0
Geldenhuis Deeps	—	—	—	—	—	12 6†
Ginsbergs	—	—		[illegible] 9*	3 0*	2 3*
Glencairns		—		1 0*	2 0*	—
Glencoe Collieries	—	6 0*	6 0*	[illegible] 0*	6 0*	7 6†
Glynn's Lydenburgs	17 0†	—	15 0*	17 6†	17 6†	14 6*
Government Areas	95 0	95 0	97 6	[illegible] 0	99 6	99 0
Hume Pipes	23 0	22 0*	22 0*	22 0	21 0	21 0A
Jhb. Board of Executors	33 0*	—	33 0*	33 0*	33 0*	33 0*
Jupiters	4 3	4 6	4 6*	5 7	5 6	5 6*
Klerksdorp Props.	—	1 0*	1 9*	1 9*	2 3	2 3
Knight Centrals	5 9*	5 10*	6 0	[illegible] 3	7 6	7 6
Knights Deeps	8 6†	8 0	—	9 0*	—	8 0*
Lace Props.	20 6*	20 0*	—	21 0	22 6	23 3
Leeuwpoort Tins	31 3	30 9	31 3	31 0	30 3*	31 0
Luipaardsvlei	—	3 0*	4 0	4 6	5 0	4 9
Lydenburg Farms	8 6	8 6*	8 10	9 6	9 3	9 5
Meyer & Charltons	—	—	—	—	94 0†	90 0*
Middelvleis	2 6†	2 4†	2 6†	2 0*	2 6	2 6
Modder B's	174 6	176 3	177 6	177 6	180 0	177 6
Modder Deeps (5s.)	48 3	49 3	49 9	50 0	51 0	51 6
Modder Easts	34 0	34 7½	34 3	34 4½	34 6	34 7½
Do. Options (3 years)	14 8	14 1*	14 9	14 7½	14 9	14 10½
Do. Options (4 years)	15 9*	15 6	16 0	16 1½	16 7½	16 3

	Fri., 10th.	Sat., 11th.	Mon., 13th.	Tues., 14th.	Wed., 15th.	Thurs., 16th.
Natal Navigation Colls.	—	25 0*	26 3*	26 0	—	26 3
National Banks	—	£15¼†	£15¼†	£15¼†	£15¼†	£15¼
New Boksburgs	1 9*	2 0	2 0	2 1*	2 0*	2 0
New Eland Diamonds	38 0	40 0	39 6	36 6	36 6	37 8
New Era Cons.	11 3*	11 3*	11 9	12 3	12 3	12 3
New Geduld Deeps	2 2	—	—	2 1*	2 3	2 8
New Heriots	7 0*	7 0*	10 0	10 3†	9 0*	9 0
New Kleinfonteins	11 9	14 0	14 3	14 0	14 3*	14 10
New Modders	£29¼	£29¼A	£30¼	£29¾	£29¾	£29⅞
New Primrose	—	—	3 3*	—	4 6*	—
New Unifieds	3 9*	3 9*	—	—	5 0*	6 0
Nigels	7 3*	7 6*	7 6*	7 9*	8 0	8 0*
Nourse Mines	13 0*	14 0†	14 0*	14 6	16 0	18 0
New States	33 3*	32 9	33 6	33 6	33 3	34 0A
Premier Preferreds	—	—	—	—	152 6†	150 0*
Pretoria Cements	87 0	87 6	90 3	90 6	92 6	95 9
Princess Estates	2 3*	2 5	2 9	2 9*	3 9	4 0
Rand Collieries	3 3*	3 6*	4 0	3 6*	—	3 6*
Rand Mines	65 0*	—	—	—	—	—
Rand Nucleus	2 0†	1 11*	2 0*	2 6	2 9	2 3*
Rand Selections	75 0*	76 0*	76 0*	76 0*	79 0*	79 0*
Randfontein Deeps	—	6 0	6 6	7 0	8 3	8 1½
Randfontein Estates	24 0	24 6	24 9	26 0	28 3	28 6
Roberts Victors	12 3	13 0	13 6	14 3*	15 3	15 6
Rooibergs	6 0*	6 3	6 0*	6 9	6 6	6 3
Roodepoort Uniteds	—	—	—	—	—	3 3*
Rose Deeps	—	—	—	—	—	17 0*
Ryan Nigels	—	5 9†	4 6*	4 6*	4 6*	—
Shebas	2 3*	2 0B	2 1*	2 6†	2 5	2 4
Simmer & Jacks	4 3*	—	5 0*	5 6*	5 6	—
Simmer Deeps	2 0*	2 0*	2 3*	3 0	2 9	2 5
S.A. Breweries	36 0*	—	38 0*	38 0*	40 0*	40 0*
S.A. Lands	6 9*	6 8*	7 0	7 5	7 6	7 6
Springs Mines	54 6*	54 9	57 0	57 3	59 6	59 6
Sub Nigels	23 9	23 3	23 6	23 9	24 3	24 9
Southern Van Ryns	8 4*	8 2*	8 3	8 6	8 3	8 3*
S.A. Alkalis	40 6*	40 0	39 0	37 0	35 0	45 0
Transvaal Lands	—	—	27 6*	27 0*	—	33 0*
Transvaal G.M. Estates	16 0†	16 0	16 6	16 6	17 0	18 0
Tudors	1 2*	—	1 2*	1 2*	1 4*	1 4*
Transvaal-Delagoa Inv.	80 0*	80 0*	80 0*	80 0*	80 0*	—
Tweefontein Collieries	25 0*	25 0*	25 0*	25 0*	25 0*	25 0*
Union 5 per cent.	£105	£105*	£105½*	£105½	£105½*	£106
Van Ryn Deeps	85 0	86 0	89 6	90 6	91 0	90 6
Van Dyks	—	3 0†	3 3*	4 0	4 1	4 6
Village Deeps	13 6	13 6*	15 0	15 9	16 0	16 3
Village Main Reefs	8 9	8 9†	9 0†	9 0†	9 0†	9 0†
Welgedachts	—	—	—	—	27 0*	—
West Rand Cons.		—	—	—	—	6 6*
Western Rand Estates	7 0	6 10*	7 0	7 0	7 9	8 0*
Witwatersrands	15 0*	18 6	20 0	21 0*	23 0	—
Witwatedsrand Deeps	10 3*	10 3*	10 3	11 0	11 0*	10 9*
Wit. Townships	30 0†	30 0†	30 0†	30 0†	—	30 0†
Wolhuters	3 6	3 5*	4 0	4 6*	4 6	4 6
West Springs	27 6	27 6	27 6	27 7½	28 0	28 4½
Do. Options	10 3*	10 0	10 9	10 6	11 0	11 3
Zaaiplaats Tins	7 3	7 6	7 9	7 6	7 3	7 0

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TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

The Drought Affects Business—The Way of Things—Oils and Colours—Timber and Buildings—Iron and Steel.

The drought has assumed formidable proportions, as it is said that South Africa has not had such a severe one for fifty years, that is throughout the length and breadth of the land. A merchant states that until the middle of September business kept fairly good, but since then the country storekeepers have become more and more nervous as to the consequences.

The Commercial Exchange.

On the Commercial Exchange this has been one of the worst months this year for business, as the mines are only purchasing sorting-up lines when reserve stocks are exhausted or getting that way. However, there are enquiries being made for machinery and other mining requirements from America chiefly. But notwithstanding more enquiries the orders are very slow in completion. The reason for this is the high prices, as for example some machinery was wanted, but the reply came back with such a price that it was out of the question to close a contract at present. Further, there seems a tendency to look for lower prices from Europe, as Belgium is getting to work again judging from the threatened strikes, also Germany seems settling down, as already circular letters have been received in Johannesburg from its manufacturers, asking to resume the old trade conditions, at quotations below both America and England. The special feature of the American replies is putting the clock back for deliveries, as some time ago it commenced with eight months' delivery in the factory; since then it extended to nine months, and now this week's cables say ten months, owing to the pressure of orders and the unsettled labour conditions. A firm's representative on the Exchange likened the mining business to a cauldron boiling with a big scum on the top—of uncertainty. A number of dealers profess to do almost anything in the way of jobbing in any lines available to give themselves a line in business. Although things are dull, yet hopes are running high as regards the future of trading. These hopes are based on the new turn of affairs in connection with the free market in our gold, as that alone will assist our poorer-grade mines. The price obtained has reached 99s. per ounce, and now people are talking the price up to £6—these, however, are the boom speculators on the share market. A traveller touring the Union once a year at least states that it is marvellous what strides the coal industry has made both in Natal and the Transvaal. He also understood that much prospecting is going on in many farms near the present producing mines, and that the farmers are getting good option money and already prospective coal properties have changed hands at enhanced prices. Another piece of news is that Mr. Harry Graumann has floated his company in London for dealing with a big gold area out Balfour and Heidelberg way and that Mr. Carl Hanau has taken a hand in it.

Oils and Colours.

Business is fair to middling in the wholesale, but quite good in the retail houses. Motor spirit is 37s. 6d. to 38s. a case, but supplies are not too plentiful. White lead is 80s. for Canadian and 100s. per 100 lbs. British. Turps are very firm, being 102s. c.i.f. at the coast, but the Johannesburg price has not yet advanced in proportion as the price is 100s. for 2-4's, but it is expected eventually to go to 120s., considering the latest cable news from New York. Linseed oil, Indian, is 100s. per case raw and 105s. boiled; the British variety is 70s. per drum of 4 Imp. galls. Castor oil, medium 110s., second quality 95s., and mineral 45s. to 50s. Glycerine, medium 1s. 9d. to 2s. per lb., and crude 1s. 4d. to 1s. 6d. Best American salad oil, 145s. to 150s. per case of 2-4's; South American, 125s.; South African, 97s. 6d. to 100s. Olive oil, French, to arrive, 32s. 6d. per gall. There is a little Spanish in the market at 27s. 6d. to 30s. per gallon. Engine oils, heavy, 42s. 6d. to 50s. per case; ditto, light, 40s. Cylinder, 40s. to 50s., according to quality. Grease, imported, £45, and local, £27½ to £32½ per ton. Neats foot oil very scarce indeed at 15s. to 17s. 6d. per gall. Washing soda, South African, £12½ per ton. Plate glass, ¼ in., is quite plentiful at 6s. 6d. per foot, but other sizes are on the short side. Mirror, 8s. per ft.; window or sheet, 16 oz. 1s. 3d., and 21 oz. 1s. 9d.; there is a big shortage

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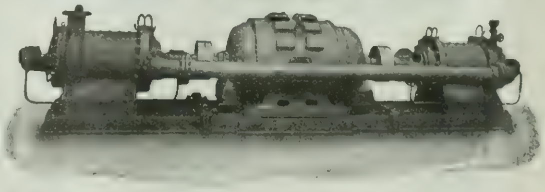

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in the large sizes, so much so that certain work is held back for supplies. Business in the glass line is said to be splendid, but prospects as to obtaining supplies from Britain are poor indeed.

Timber and Building Materials.

Deals are very scarce but plenty are expected at the end of this month. However, imported windows, doors, casements, as well as shelving, are practically out of stock. Deals are 1s. 7d. and 1s. 8d. and even more for long lengths; floorings, 8½d. to 9d.; and ceilings, 6d. to 6½d. per ft. Iron is unobtainable in any quantity, but some has been booked for delivery in two weeks at 1s. 5d. per ft. Business is poor for lack of stock, but the building trade is buoyant in all departments. Bricks cannot be had quickly, only in small quantities, as the kilns are booked up. Firms are getting supplied from Boksburg and other brick yards from along the Reef. The price for best stock bricks is about 50s. per 1,000 at the kiln and another 20s. to 30s. must be added when delivery is required, which latter is very dear, but it is all on account of the drought and the price of forage. Cement is not quite so scarce, but it is up 6d. per bag, being 8s. 6d. on rail, with an allowance of 1s. per empty bag when returned. It is said that after the end of this month cement will be freer on account of the increased output. Lime has advanced 3d. per bag. White lime, slaked, 6s. 6d. per bag of 160 lbs., unslaked 8s. 6d.; blue lime, 4s. 9d.; and plaster lime, 5s. 9d.

Iron, Steel and Machinery.

The demand for bar iron and steel is much the same, being none too good, as the engineering works and foundries have slackened off considerably. But there are fair enquiries from the Transvaal and Natal coal fields, as well as Southern Rhodesia. Wire nails from Canada have advanced, and the ordinary price outside speculative lots is as follows: 1 in., 55s.; 1½ in., 52s. 6d.; 2 in., 50s.; 2½ in., 42s. 6d.; 3 in., 45s.; 4 in., 42s. 6d.; 6 in., 41s. Brass rods, 2s. 6d. per lb. Imported mild steel, 40s.; drill steel, 7½d. per lb. The demand for high pressure boilers is excellent, as there are only a few occasional second-hand ones coming into the market. Altogether all second-hand machinery and mining material are more and more difficult to get, therefore quantities of orders are on the waiting list.

THE ELDORADO BANKET GOLD MINING COMPANY, LTD.

For Sale by Public Tender

the whole of the Claims comprising the

ELDORADO MINE.

TENDERS ARE INVITED for the outright purchase for cash of the above mine, and should be sent to the Managers, The Goldfields Rhodesian Development Company, Ltd., P.O. Box 4, Bulawayo, or P.O. Box 380, Salisbury, from whom further particulars may be obtained.

NO BUILDINGS, MACHINERY OR PLANT ARE INCLUDED in the sale.

TENDERS CLOSE on NOVEMBER 15th, 1919.

The Company does not bind itself to accept the highest or any tender.

Interesting details concerning the actual ceremony of signing the Peace Treaty at Versailles keep comng to hand. We learn, for instance, that the Prime Minister of Great Britain signed the Treaty with his own gold Waterman's Ideal Fountain Pen—a Christmas gift from a friend. Other representatives of Great Britain, and also of Australia, Poland, Belgium, Japan, Roumania, Italy, Greece, and Czecho-Slovakia, signed the Treaty with Waterman's Ideal Fountain Pens.

South African Cement.

A lecture on "Engineering Materials: Manufacture and Testing" was given last week by Mr. George Stewart, A.M.Inst.C.E., in the lecture theatre of the Cape University Engineering Buildings. The lecturer first dealt with cement, mentioning that our earliest knowledge of cement came from the Romans, who produced it from a mixture such as that under which Herculanaeum and Pompeii lay buried for so many years. The name "Portland cement" originated from the fact that the colour was similar to that of the stone obtained from the Portland quarries, but it must not be supposed that Portland cement came from Portland. The name was given by Joseph Aspdin, a Leeds bricklayer, to artificial cement prepared by heating together a mixture of lime and clay. He established a factory for its manufacture at Wakefield in 1825. Great impetus was given to the industry in its early days by the researches carried out by Sir C. W. Pasley and Mr. John Grant, to whom we were to-day largely indebted for the knowledge we possessed of the properties and peculiarities of this important constructive material. Alluding to the production of cement in South Africa, the lecturer stated that the Pretoria Portland Cement Co. was established in 1892 under a concession from the Transvaal Republic, which gave the company the sole right of manufacture. This concession was subsequently cancelled by mutual consent, after which the Government imposed a duty of 20 per cent. on the imported cement. About four years ago the company constructed another factory near to Mafeking, where three kilns were installed. The output in the company's first year was about 24,000 bags, and had now risen to about 2,000,000 bags per annum. Cement was also manufactured by White's South African Cement Co. at works situated three miles south of Ventersburg Road Station. These works started in September, 1914, and were to-day capable of producing nearly a million bags of cement per annum. They had never worked to their full capacity, owing to difficulties such as shortage of water, native labour, and scarcity of trucks, combined with changed conditions at the quarries and the flooding thereof. It might also be stated that the works price of this cement to-day was identical with the price when they first placed their product on the South African market. The advanced price at the coast and in other territories was almost entirely due to the enhanced railage rates introduced by the Administration towards the end of last year. At the present time an acute shortage of cement was being experienced in most of the towns in the Union, owing to the Railway Administration not being able to supply the necessary rolling-stock. The lecturer proceeded to describe the two processes of manufacture, the wet and the dry. He remarked that engineers usually stipulated that cement supplied to them should be in accordance with the British standard specification. The cement manufactured in South Africa was guaranteed by the manufacturers to withstand these tests. Usually the tests carried out at the Capetown University had given results above those specified by the British standard specification. Tests carried out at the Government laboratories in Johannesburg had also proved South African cement to withstand the same tests that were applied to the British manufactured cement.

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Notes and News

Pretoria Cement.

Pretoria Cements were a great feature in the market last week. It is intended to increase the capital by 100,000 shares, of which 50,000 are to be offered to shareholders at 80s., and the remainder will be held in reserve.

* * * *

Our Special Coal Number.

Our special coal number, which is now in preparation, will be an entirely separate issue of the Journal, and will be priced at 2s. 6d. per copy. This charge is necessary owing to the expense involved. Orders may be booked in advance at this office.

* * * *

The Kalihari Problem.

The articles on the Kalahari Problem by Mr. August Karlson that recently appeared in our pages have been reprinted in pamphlet form and can be obtained at the office of this paper at 2s. each post free. The articles are accompanied by a map showing the irrigation schemes proposed by Professor Schwarz and Mr. Karlson.

* * * *

Stienies Diamonds.

"Stienies Diamonds" were introduced on the Market last Friday week, and a few thousand have changed hands from 8s. to 10s. 6d. The capital is £30,000 in 5s. shares, and the option properties are the farms "Stieniesrust," "Driehoek," and "Driehoek A," in the Winburg district, and it is understood that the indications are favourable.

* * * *

Gold Fields Rhodesian: Year's Results.

The Gold Fields Rhodesian Development Co., Ltd., have received the following cable from their London Office relative to the operations of the company during the year ended 31st May, 1919: "Annual report and accounts will be posted to the shareholders 13th of October. Net profit after deduction of interim dividend of 5 per cent. paid last May, £173,991 5s. 5d., out of which the board of directors recommend the payment of a final dividend of 5 per cent. less income tax, absorbing £62,855 10s., and leaving £111,135 15s. 5d. to be carried forward.

* * * *

The Pretoria District.

Mr. Trevor, the Inspector of Mines for the Pretoria district, has written for the Chemical, Metallurgical and Mining Society on the economic results attending gold and base mining metal there in the ten years to 1914. The value of minerals produced was 10½ millions, but eight were absorbed by wages and stores, and £800,000 was paid in profit tax. The balance of £1,800,000 had to meet all other expenses, including interest and amortisation. The district has profited greatly from the mining activity. Railways have been built, and farming put on a paying basis by the markets provided. Zaaiplaats was the outstanding success, returning 530 per cent. to original shareholders.

* * * *

Royal Mint at Melbourne.

Some interesting details of the operations of the Victorian branch of the Royal Mint at Melbourne have recently been made available. The Mint was established in 1872, and, according to the latest returns, 37,300,120 ounces of gold have been received, the coinage value of which has been £146,628,219. Of the gold received, 27,588,755 ounces were raised in Victoria, and the balance in New Zealand and Western Australia. The output has consisted of 134,813,500 sovereigns, 1,893,559 half-sovereigns, and 2,606,206 ounces of gold bullion, the total value of coin and bullion being £146,632,904. The Melbourne Mint has been coining silver as well as gold since 1916, and up to the end of last year the number of silver pieces coined was 31,484,806, of a total value of £1,842,150.

Proposed Association of U.K. Manufacturers.

It has been felt for some time in South Africa that there is a need for a representative organisation to look after the interests of United Kingdom manufacturers, and to bring their representatives together, and a movement is on foot for the establishment of such a body. It is proposed that the membership should be composed of United Kingdom manufacturers exercising a vote by proxy through their local agents or branches, and, under certain conditions, of agents for United Kingdom firms in their own right. H.M. Senior Trade Commissioner in South Africa, Mr. W. G. Wickham, is interested in the movement, and United Kingdom firms who think that the Association is likely to be of advantage to them might do well to communicate with him (P.O. Box 839, Johannesburg) or with their local agent or branch.

* * * *

Magadi Soda.

Since its inception in January, 1911, a series of misfortunes have been encountered by this company, which is working a deposit of natural soda in East Africa estimated to contain some 200,000,000 tons. Trading was about to commence when the European war broke out, and subsequently the branch line connecting the deposits with Uganda was taken over by the military. This was followed in January, 1916, by the Government commandeering the factory which had been erected near Manchester. A claim for compensation has been lodged with the military authorities in East Africa, but this has been repudiated and at present remains unsettled. The works near Manchester are still in the occupation of the military authorities, but no payment of rent has yet been made. In the report for 1918 just issued a loss of £48,954 is recorded, making a total debit balance of £100,900. During the period under review the increase in native wages and cost of all material made the hand winning of soda uneconomical, and it was decided to discontinue production and devote all energies to the completion of mechanical winning and transporting plant. Caustic soda of the highest quality is now being produced, the plant having been completed at the end of last year.

* * * *

London and Rhodesian Mining.

Mr. L. E. B. Homan, presiding recently at an extraordinary general meeting of the London and Rhodesian Mining and Land Co., Ltd., called to consider resolutions reducing the capital of the company from £500,000 to £290,337, said the result would be to write down the company's assets and bring them in accord with their present value. In regard to the Cam and Motor interest, they proposed using £70,000 in writing that down, and £30,000 in the case of writing down Linchwe Concessions. Although the Radnor mine asset would now practically disappear, the property was not worked out, and a small revenue was being earned by tributing the tailings. In regard to the property account in the yearly reports they had continued to abandon mining claims, but without providing heavy depreciation. Acting on the advice of their engineers, it was proposed to write this down by half, which meant a reduction of over £60,000. The reductions might seem drastic, but they were necessary, and had to be faced. In the opinion of those best qualified to judge the reduction in the face value of the shares would not operate to their disadvantage in the market—on the contrary, the par value should soon be reached, and possibly exceeded.—The resolutions were carried unanimously.

* * * *

Grootvlei Proprietary Mines Issue.

The shares, with options, in Grootvlei Proprietary Mines, Ltd., offered in London in mail week, were readily subscribed. The Grootvlei property, which comprises 7,421 acres, has for its near neighbours Geduld Proprietary, Springs, and Daggafontein mines. The Grootvlei Company holds mineral rights over the whole of the farm of that name, No. 176 Witwatersrand district, upon which the Main Reef has been proved by boreholes, and of its value expert opinion entertains no doubt. The consulting engineer (Mr. C. B. Kingston) has advised the location of the mining area on the south-west portion of the farm, and should this be granted the total area will comprise 2,500 claims. The developments upon the properties named have been so satisfactory that the directors have entered into an arrangement with the African and European Investment Co., Ltd., to purchase 250,000 Grootvlei shares at 21s. per share, in consideration of which they receive a commission of 1s. per share, and are entitled to options over an additional 750,000 shares. It is the African and European Investment Co. that has agreed to receive offers for 250,000 shares at a price of 21s. per share, payable 3s. 6d. on application, 2s. 6d. on acceptance, and 5s. at intervals of not less than three months, or payments may be in full on acceptance. Registered holders of these shares will also be entitled during a period of two years from September 30, 1919, to subscribe for and receive allotments of an equivalent number of shares to those now subscribed for at 25s. per share. The option rights can be exercised at any time during the period of the option and over any portion of it, and option certificates will be issued. Grootvlei capital is £1,500,000, and the 250,000 shares now offered will bring the number up to 611,650, leaving 888,350 shares for issue to meet the outstanding options. Should all the options be exercised, the directors will have funds to develop and equip the mine with a reduction plant capable of crushing 600,000 tons per annum. The sum provided by the present sale of 250,000 shares will enable the directors at once to proceed with the sinking of the necessary shaft and provide the preliminary equipment for the purpose.

* * * *

Latest from Modder East.

As we anticipated last week, the latest Modder East quarterly report contains no new estimate of the ore reserves. On the quarter's development footage on reef the payable portion of 1,920 feet, or 75·3 per cent., averaged 19·1 dwts. over 22 inches, or 420 inch-dwts., whilst of the development on reef to date the payable portion of 7,612 feet, or 52·2 per cent., has averaged 24·3 dwts. over 20 inches, or 486 inch-dwts. Apart from the marked improvement in the percentage of payability, viz., 75·3 per cent. as compared with 55 per cent. for the preceding quarter, there are no special features to which attention need be directed. The results to date are shown by the following:—No. 1 shaft: Payable, 42·52 per cent., footage 7,612, average width 20 inches, average value 24·3 dwts.; No. 2 shaft: payable 100·0 per cent., footage 490, average width 24 inches, average value 20·2 dwts.; No. 3 shaft: payable 74·9 per cent., footage 1,720, average width 26 inches, average value 15·5 dwts.; total payable 56·5 per cent., total footage 9,822, total average width 21 inches, total average value 22·5 dwts. Several heavy feeders of water (particularly in No. 1 shaft section) have recently been encountered in different parts of the mine, which not only have taxed the pumping plant to its utmost capacity, but on occasion have necessitated bailing with the whole of the available winding plant. Advantage has been taken of the cementation process to entirely close off strong flows of water, and also to deal with similar quantities wherever found. To obviate suddenly striking such feeders, pilot diamond drill holes are being kept ahead of several of the principal working faces. The average number of whites employed was 182, and of natives 1,097. In regard to the reduction plant of an initial monthly capacity of 40,000 tons (to which reference was made in the directors' annual report, issued to shareholders in August last, the enquiries and rough estimates made so far indicate clearly that, on account of the prevailing unsettled industrial conditions in Europe and America, no forecast can at present be made as to the probable date of erection of the plant, and also emphasise the fact that in order to meet the heavy cost of the plant, as well as the requirements for development of the mine in the meanwhile, the company will need all the funds which will be at its disposal under the existing financial arrangements. The expenditure for the quarter amounted to £80,370.

TOPICS OF THE WEEK.

UNEMPLOYMENT, THE MINES AND THE GOVERNMENT.

Unemployment, particularly in regard to the returned soldiers, is the problem of the moment, and the Prime Minister has issued a strong appeal to employers on the subject. He says that there are now approximately 4,000 European returned soldiers who are seeking employment, and some of the men still to return from demobilisation will also require assistance in finding employment. The Government has rendered every assistance to returned soldiers wishing to settle on the land, and training is provided at the various schools of agriculture and training farms, where numerous vacancies now exist. In addition facilities exist whereby returned soldiers may be apprenticed to approved farmers for the purpose of training. Facilities also exist for Government assistance to returned soldiers whose studies have been interrupted by the war and who now wish to undergo a course of higher education. The Prime Minister makes an urgent appeal to all employers of labour and the Press throughout the Union to assist the various Advisory Boards, Committees and others appointed to deal with the difficult problem of placing returned soldiers in employment. A large number of these men are unable, for various reasons, to avail themselves of Government assistance granted in the various schemes mentioned, and it is for those principally that the appeal is made. The Prime Minister is confident that all concerned will unite in one common effort to solve the problem of the re-settlement in civil life of men who went forward to fight for this country and so prevent these men who have done their duty from suffering any unnecessary hardships on their return. As far as the mines are concerned, it is clear that every effort has been made to absorb as many white men as possible, the number employed at the end of August being 23,359 as against 22,523 at the beginning of the year. Indeed, the appeal from the Prime Minister lends special point to the plea put forward by the Low-Grade Mines Commission for direct Government assistance to the low-grade mines in the shape of lower railway rates, relaxed mining regulations, and an augmented native labour supply. It is the obvious and bounden duty of the Government, in view of the situation disclosed by the Prime Minister, to assent to those requests of the mining industry made in the interests of expansion and increased employment for all. Apart from aid to the mining industry, there are other clearly indicated methods whereby the Government can itself directly and enormously effect an expansion of the field of employment in the country. These are entirely apart from the temporary palliatives which we see recommended in the papers every day, and which to our mind both fail to go to the root of things and omit to remind the Government of its own greater opportunities and responsibilities in the matter. Only the other day Mr. E. C. Reynolds, the General Manager of the National Bank, declared, alluding to what the Government should do, that the establishment and maintenance of "key industries" should correctly be assigned to them. "I think it will not be going too far," said Mr. Reynolds, "if I suggest that the point of view which Government ought to take is that industries upon which the country could depend in time of war and world upheavals to maintain itself without undue dependence on outside sources are their concern. I would suggest shipbuilding and repairs, an arms and ammunition factory, materials for clothing the forces, an air-machine factory, and timber and iron production." This is a fairly useful list to start with and possesses the two-fold merit of making the country independent and providing large scope for employment. In yet another way there is ready at hand to the Government a means for removing the main check on industrial enterprise in this country. We saw the other day that the unfair tax known as the "Excess Profits Tax" was the subject of considerable criticism at the recent annual meetings of the Associated Chambers of Commerce and of the Manufacturers' Association, who are the people most directly affected. Several speakers dealt fully with it and pointed out that some time since the then Acting Premier had been kind enough publicly to congratulate manufacturers on their great progress during the war, but took occasion solemnly to warn them that this advance could not be maintained in the face of early oversea competition, unless industrialists made up their minds to organise all of their resources, and were prepared to utilise their own or outside capital for the purpose of immediate development. That was excellent advice, but it became ironic when addressed to national wealth builders whose progress was not only hampered, but absolutely barred, by the iniquitous incidence of the Excess Profits Tax. Obviously the odds against investors in industrial or commercial enterprises, under the present system of taxation, are very heavy. A man may start a business and by care and economy save money which he invests in machinery and plant, from which in turn he can produce larger quantities of goods or get a larger turnover, and a greater aggregate profit. The Government immediately appropriates a large proportion of that profit as "Excess Profits." The result is to remove the incentive for development, and when that is taken away, the country's industries suffer in proportion, and the field of employment remains restricted, despite all the appeals from the Prime Minister. Briefly, in the three ways we have mentioned, *i.e.*, by lightening the burden on the mines, by fostering "key industries," and by removing the direct deterrent to enterprise known as the "Excess Profits Tax" can the Government itself largely render effective the Prime Minister's appeal.

V.F.P. and Transvaal Power.

At the annual general meeting of the V.F.P. and T.P. Co., held in London recently, the Marquis of Winchester presided, and in submitting the report and accounts for the year ended December 31, 1918, congratulated the shareholders on the continued success of the business. Notwithstanding the increase in costs and the serious, though temporary, effect on the mining industry due to the scourge of influenza during the latter months of the year the revenue showed improvement, and in spite of the increase in taxation, the year's trading had enabled the Company to maintain the same dividend and additions to the reserve fund as for the prevous year with a carry forward of £93,693 to the current year, which was practically the same amount as for the year 1917. The profit and loss account showed a revenue of £860,172, being an increase of £31,919 over the year 1917. The net result for the year after providing for interest, premium and expenses of debentures, depreciation, and British taxation, being a profit of £224,128, out of which profit, plus the amount of £97,690 brought forward from the previous year, £50,000 had been transferred to the reserve fund and dividends at the rate of 10 per cent. on the preference shares and 5 per cent. on the ordinary shares, both less income tax, had been paid, leaving a balance standing to the credit of the profit and loss account of £93,693 which had been carried forward to the year 1919. Dealing with the affairs of the Company generally, the Chairman stated that the satisfactory maintenance of the supply under the trying conditions produced by the war reflected the greatest credit on the Company's operating and maintenance staff and the difficulty of providing spare parts and replacements had been most successfully overcome by the staff employed at the Company's workshops who, by their own ingenuity and skill, had succeeded in producing special and complicated parts of machinery never previously manufactured in South Africa. In the course of his remarks, the Chairman referred to the death of General Botha, and stated that in his (the Chairman's) personal association with him in regard to the Company's affairs in South Africa, General Botha had always met him with a frankness which was refreshing, and when convinced of the value the Company's undertaking would prove to South Africa his support was assured. In conclusion, the Chairman expressed the great appreciation of the Board for the good work done by the management and staff, which was evidenced by the fact that the Company had been able to show such satisfactory results as those disclosed in the report and accounts.

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THE YEAR WITH THE KNIGHTS DEEP.

How to Keep the Mine Going and Provide for Necessary Capital Expenditure—More Native Labour, Higher Efficiency and Lower Railway Rates Required.

THE year ended July 31 at the Knights Deep resulted in a loss of £18,610, leaving a net deficit of £20,441. Mr. O. P. Powell, the acting consulting engineer, in his annual report, writes as follows: Compared with the previous year the ore milled was decreased by 123,800 tons, the revenue per ton being increased by 1s. 9·557d. Working costs were 2s. 6·371d. higher per ton milled, so that a loss on working of £18,610 14s. 2d. was shown in place of a profit of £21,019 0s. 1d. for the preceding year. The ore reserves fully developed at 31st July, 1919, is estimated at 997,000 mine tons of an average value of 4·8 dwts. per ton, in addition to which the partially developed ore is estimated at 41,000 mine tons of an indicated value of 4·5 dwts. per ton. The estimate excludes 620,000 tons of low-grade ore valued at 3·9 dwts. per ton. In addition to the reserve there is a large reclamation tonnage which would be expected to yield a profit, under favourable conditions. On account of insufficient information an estimate of this tonnage cannot be made. To enable this mine to continue operations and to provide the money urgently required to extend shaft sinking and development in its western section, it is hoped that relief will be afforded in such respects as higher average efficiency, an improved native labour supply, a higher price for gold and lower railway rates. Railage of coal alone costs the mine about £18,000 per annum. The Lohse shaft pumping station deals annually with about 350,000,000 gallons of underground water. About 56 per cent. of this water is pumped at the cost of neighbouring mines, including the Simmer Deep and Jupiter mines, which would cease to contribute to the expenditure in the event of their having to close down. Continuance of operations on Knights Deep depends to a great extent on smooth running, and the mine could not withstand serious dislocation of work through labour unsettlement. I desire to express my appreciation of the loyal and sustained efforts of the manager and his staff who have carried on their work during the year under most trying circumstances.

PERSONAL.

Mr. E. M. Weston is on his way back from Namaqualand, where he went to report on the properties of the Solomon Syndicate.

* * * *

Lieut-Colonel H. H. Johnson, D.S.O., M.I.M. & M., consulting engineer, has returned from Canada, and expects to be in London for a few weeks.

* * * *

Mr. H. S. Denny, C.B.E., has been demobilised after four years of factory work and three months assisting General Plumer in Cologne.

* * * *

Mr. W. E. Bleloch is leaving for England by the s.s. Edinburgh Castle on the 3rd November. He is to give a series of illustrated lectures in the United Kingdom on the Far East Rand and the valuation of shares. Next Wednesday evening he will lecture on this subject in the Selborne Hall and will deal with the E.R.P.M. problem and the extension of Central Rand Main Reef series south-east of Boksburg. Mr. A. E. O'Flaherty will take the chair at 8 o'clock. All interested are invited and questions will be answered.

* * * *

From the Camborne School of Metalliferous Mining we learn that Mr. J. G. Lawn has consented to take the position of Acting-Principal for a time, and to conduct the mining classes, until the governors find an engineer who can accept a permanent appointment. It will be remembered that he was lecturer at the school during the years 1907 and 1908. It is also announced that Mr. H. W. Hutchin has been appointed lecturer on assaying, taking the position formerly occupied by the late Mr. J. J. Beringer. Mr. Hutchin was for some years lecturer at the school, but left in 1908 to establish a private practice.

* * * *

We regret to report the death of Mr. Alfred Ernest Clague, which occurred on the 5th inst. at the Annasona Mine, Inyati district. The late Mr. Clague was one of the best known mining men in Rhodesia. After being engaged in mining on the Rand for some time he went to Rhodesia in 1898 for Messrs. Robert Williams & Co. Subsequently he entered the service of Rhodesia, Ltd., and for many years has acted as engineer to that company, and been in charge of their more important mines. Mr. Clague's great experience and knowledge of mining, and his sound judgment, commanded general respect, and his death at a comparatively early age is a loss to the mining industry of the country.

South African Mining Syndicate.

A MYSTERIOUS CIRCULAR.

The following mysterious circular has been sent to the shareholders of the South African Mining Syndicate, Ltd.:—

"Cable information to hand has induced the directors to instruct me to inform the shareholders that the mining claims located in the Northern Transvaal and owned by this company will, in their opinion, based on available information, including the report of an eminent mining engineer well known in London, develop into a proposition worth several times the total capital of this company.

"Already a good amount of development work has been accomplished, exposing quartz assaying gold valued at 68s. per ton of quartz over a width of 24 feet. Gold quartz carrying 8 dwts. of gold is to-day considered a very profitable mining proposition, and shareholders will therefore readily appreciate the importance of any property whose mineral contents will yield double that amount of gold. In the near future, when sufficient gold quartz has been blocked out to justify the erection of milling machinery, this property can be calculated to produce substantial profits.

"It may be recalled that the district where this property is located is considered by many qualified judges to contain some of the richest gold propositions in South Africa, but development was retarded by the then great distance from the railway. During the war the railway has been completed to the district."

Scope for Engineering Apprentices.

The Witwatersrand Juvenile Advisory Board recently passed a resolution urging a relaxation of the present limitation of the number of apprentices who may be employed in trades, in view of the acuteness of the position created by the large number of youths returning from active service. A letter was addressed to the S.A. Industrial Federation on the subject, and the secretary in his reply states:—

"I beg to inform you that in the case of apprentices returning from active service, whose places have been filled by other lads, the ratio of apprentices has been relaxed to enable such returned soldier apprentices to be taken on without displacing those already employed in any particular shop or industry. In the engineering trades, to which most lads desire to be apprenticed, the ratio is very much in excess of that provided by the various agreements. In very many shops there are nearly as many apprentices as journeymen, and it is impossible to turn out good tradesmen on this basis; in fact, the trades unions appear to be tolerating a considerable relaxation all round in the engineering trades, while apprentices do not seem to manifest a desire to learn anything else." The Board has been notified that the conditions for admission of apprentices to the Government Miners' Training School have recently been made more stringent, "in view of the fact that a number of apprentices have absconded after a short period of service with the result that the Board has suffered considerable financial loss."

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PROGRESS OF THE "J.C.I." SUBSIDIARIES.

Working Costs Increased by Phthisis Act Assessments—Serious Native Shortage—State Mines Ore Reserves, 10,054,771 Tons.

At the Consolidated Langlaagte the total profit for the quarter ended September 30 was £32,256. No allowance has been made in this for Colonial taxation, nor the Provincial Gold Profits Tax. The expenditure on capital account amounted to £2,247, and debenture interest £1,031. During the quarter there was a decrease of 8,700 tons in the quantity of ore crushed. The grade showed an increase of 2d. per ton, but the costs were higher by 6d. per ton and the profit was £2,767 less than that for the preceding three months. The development footage sampled totalled 3,157 feet and gave the following results: Payable, 1,273 ft., having an average value of 50·36 dwts. over 14·19 in. of reef; unpayable, 1,884 ft., having an average value of 8·87 dwts. over 13·91 in. The native labour supply at the moment is poor. At the end of September there were working underground only 63·8 per cent. of the complement.

At Government Gold Mining Areas the total profit for the quarter was £257,520. No allowance has been made in the above for Government's share of profits and special war levy, nor the Provincial Gold Profits tax. The expenditure on capital account amounted to £3,048. There was an improvement of 10d. per ton in the grade, but as the quantity of ore crushed was 17,500 tons less and the working costs were 8d. per ton higher, the working profit was £8,936 lower than for the previous quarter. The development footage sampled totalled 6,190 ft. and gave the following results: Payable, 3,990 ft., having an average value of 18·4 dwts. over 50 in. of reef; reef partly exposed, 80 ft., having an average value of 2·2 dwts. over 57 in.; unpayable, 2,120 ft., having an average value of 2·5 dwts. over 46 in. The payable ore reserves were increased by 151,771 tons during the quarter and now stand at 10,054,771 tons. The number of natives working underground for the quarter averaged 5,076, which is not nearly enough for the mine's requirements. Recently natives have come in fairly well, and on the 10th October the number at work underground was 5,262.

At the Langlaagte Estate the total profit for the quarter was £18,251. No allowance has been made in the above for Colonial taxation, nor the Provincial Gold Profits Tax. The expenditure on capital account amounted to £9,273. The quantity of ore crushed was 840 tons less than that for the previous quarter, and as the grade showed a reduction of 1s. per ton, and the costs an increase of 6d. per ton, the working profit was decreased by £9,404 as compared with the preceding three months. The development footage sampled totalled 1,777 ft., and gave the following results: Payable, 1,338 ft., having an average value of 20·4 dwts. over 20 in. of reef; unpayable, 439 ft., having an average value of 9·2 dwts. over 15 in. This mine is suffering severely from shortage of native labour. For the quarter the average number of natives working underground was 2,598, as against an average of 2,851 for the same quarter last year.

At the New Primrose the total profit for the quarter was £6,108. No allowance has been made in the above for Colonial taxation, nor the Provincial Gold Profits Tax. The expenditure on capital account amounted to £350. The quantity of ore crushed was less by 1,700 tons, as compared with the preceding three months. The grade showed an improvement of 1s. 7d. per ton, but the costs were 1s. 9d. per ton higher, resulting in a decrease of £898 in the working profit for the quarter. The development footage sampled totalled 194 ft., and gave the following results: Payable, 313 ft., having an average value of 14·8 dwts. over 31 in. of reef; unpayable, 181 ft., having an average value of 5·7 dwts. over 23 in. The average number of natives working during the quarter was 1,055, a decrease of 60 natives as compared with the previous quarter.

At the New Unified Main Reef the total profit for the quarter was £4,881. No allowance has been made in the above for Colonial taxation, nor the Provincial Gold Profits Tax. The quantity of ore crushed was 1,200 tons less than that for the previous three months. The grade showed an improvement of 9d. per ton, but the working costs were higher by 1s. 1d. per ton, with the result that the working profit was £700 lower than for the previous quarter. The development footage sampled totalled 117 ft., and gave the following results: Payable, 112 ft., having an average value of 14·2 dwts. over 15 in. of reef; unpayable, 5 ft., having an average value of 16·8 dwts. over 9 in.

At the Randfontein Central the total profit for the quarter was £36,547. No Colonial or other taxation will be payable in respect of the quarter's profits. The expenditure on capital account amounted to £57,870, and debenture interest to £36,470. The ore crushed was increased by 25,200 tons as compared with the previous quarter. The grade was 3d. per ton lower, but there was a reduction of 4d. per ton in the working costs, and the working profit was £3,429 more than that for the preceding three months. The shaft sinking accomplished was as follows: No. 7 (Mynpacht) shaft, 112 ft., total depth 3,267 ft.; north vertical shaft, 389 ft., total depth 3,296 ft.; south vertical shaft, 501 ft., total depth 3,199 ft. During the month of September the Randfontein leader was passed through in the north vertical

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shaft, having a dip of 60 degrees and giving the satisfactory average value of 9·8 dwts. over 18 in. The development footage sampled totalled 8,677 ft., and gave the following results: Payable, 7,125 ft., having an average value of 25·2 dwts. over 15 in. of reef; unpayable, 1,552 ft., having an average value of 7·4 dwts. over 23 in. The average number of natives working underground during the quarter was only 11,690, whilst the complement is 15,000.

At the Van Ryn Deep the total profit for the quarter was £171,124. No allowance has been made in the above for Colonial taxation, nor the Provincial Gold Profits Tax. The expenditure on capital account amounted to £10,680. The quantity of ore crushed was increased by 2,250 tons as compared with the preceding three months. The costs were higher by 9d. per ton, but the grade showed an improvement of 2s. 3d. per ton, and the working profit was £13,637 more than that for the previous quarter. The development footage sampled totalled 1,935 feet and gave the following results: Payable, 1,447 ft., having an average value of 31 dwts. over 29 in. of reef; unpayable, 488 ft., having an average value of 6·3 dwts. over 33 in. The average number of natives working underground during the quarter was 2,680, a decrease of 155 natives as compared with the previous quarter.

At the Witwatersrand the total profit for the quarter was £11,011. No allowance has been made in the above for Colonial taxation, nor the Provincial Gold Profits Tax. The expenditure on capital account amounted to £5,105. The quantity of ore crushed was 3,950 tons less than that for the preceding three months, and as the grade was 4d. per ton lower and the working costs 1s. 5d. per ton higher, the working profit was £9,184 less than the previous quarter. The development footage sampled totalled 1,690 ft., and gave the following results: Payable, 910 ft., having an average value of 12 dwts. over 37 in. of reef; unpayable, 780 ft., having an average value of 4·8 dwts. over 29 in. The average number of natives employed underground during the quarter was 1,803, a decrease of 98 natives as compared with the previous quarter.

At the New State Areas the expenditure on capital account amounted to £66,990 in the September quarter. Shaft sinking: The south shaft was sunk 367 ft. during the quarter and attained a total depth of 834 ft. The dolomite has been passed through and the water caught up in a ring. The shaft is now in quartzite. The north shaft was sunk 184 ft. during the quarter and attained a total depth of 465 ft. In this shaft an extremely hard syenite was encountered which made progress very slow; this has been passed through and the shaft is now in a free dolomite carrying little water. South shaft: The compressor was put to work with condensing and spray cooling plants. The drill sharpening shop was equipped with a Leyner sharpener. North shaft: A Leyner drill sharpening machine has been installed. The railway siding is nearing completion. An electricians' workshop has been built and the construction of a macadamised road between the shafts has been started. Electric light has been installed throughout the quarters and the wiring of the compounds is nearing completion.

GENERAL.

Working costs were adversely affected in August and September, due to the increased assessment under the new Phthisis Act. These results do not include the increased price now being obtained under the new arrangement for the free disposal of the gold shipped since 25th July last. The gold so far sold is equal to slightly under one month's output of the Witwatersrand, and has realised a premium of approximately 16 per cent. Any increased profits obtained by the companies will be published quarterly after receipt of account sales.

New Kleinfontein.

The report of the New Kleinfontein directors for the quarter ended 30th September, 1919, shows:—Mine: Shaft sinking: Number of feet sunk, 61 ft.; number of feet ore bins, etc., 32 ft. Development (excluding shafts): Number of feet driven, risen and sunk, excluding boxholes, 3,731 ft.; footage sampled, 2,330 ft.; footage sampled (payable), 635 ft.; mining width (payable), 53 in.; assay value (payable), 6·81 dwts.; number of feet boxholed for sampling purposes, 243 ft. Ore treatment: Ore milled, 143,540 tons; Capital expenditure: Shaft sinking and equipment, £3,952. Revenue and expenditure: Working costs, £200,060, or £1 7s. 11d. per ton milled; working profit, £3,600, or 6d. per ton milled; revenue, £203,660, or £1 8s. 5d. per ton milled. The Apex reduction plant closed down on 31st July, 1919. The major portion of the clean-up from this plant is included in the revenue for the quarter. No provision has been made in the above figures for the increased price obtained recently for gold, nor has the account been charged with interest amounting to £2,549.

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NATAL'S COAL TRADE.

Coaling Capacity at Durban—Delays Cause Bitter Disappointment—The Truck Shortage Question—Deviations on the Railway may Help—Toying With a Great Industry—Lack of Agreement Amongst Coal Owners.

[*By Our Special Commissioner in Natal.*]

War conditions have been responsible both for a large increase in the Natal coal output and for a subsequent curtailment of production. The declaration of the Suez Canal zone as a theatre of war and the deflection to the Cape route of shipping bound to and from the East and Australasia was one big factor in the development of Durban as a coaling port. Australian convoys have constituted a big class of customers, and the generous patronage of the Admiralty has also provided a large market, but latterly the coal output of Natal has been curtailed by insufficiency of rolling stock on the South African Railways and also by the disastrous effects of the influenza epidemic. Truck shortage has always restricted the production, but latterly this handicap has been more marked than ever. There is no diminution of demand by shipowners. Steamers are frequently delayed at Durban for days, sometimes for weeks, because the Railway and Harbour authorities are unable to fill bunkers. Only the other day the demands of shipping in the port amounted to 46,000 tons and only a small portion of these requirements could be delivered. The plain truth is that the port is being starved for coal, and some shipowners and colliery directors fear that the present delays in coaling may result in shipping fighting shy of Durban. The Railway and Harbours Administration are doing their best to cope with the traffic. Deviations on the main line are being effected and should result in quicker runs from the coal fields to the coast, but no very appreciable measure of relief can be looked for until a large proportion of the new rolling and loco. stock on order is delivered and is in commission. Simultaneously there will have to be increases in the coaling installations at the Bluff. The present arrangements there, though good in their way, will be wholly insufficient to bunker ships and load coal for the export trade when the Railways are in a position to deliver coal in quantities more closely approaching to shipping requirements. Durban, by virtue of its geographical position both in regard to the Natal and Zululand coal fields and also in regard to ocean routes, and particularly the Eastern routes, is destined to become by far and away the most important coaling port in the Southern Hemisphere. If it does not achieve this the Union's Departments of Railways and Harbours and the colliery companies themselves will merit severe censure, for all the factors necessary for the building up to a really large bunker and export trade are in existence there—cheap coal at no great distance from the coast, a magnificent harbour wherein the largest ships afloat could be berthed, and a most favoured position in regard to the Eastern and South American markets. But so far Natal has never yet produced anything approaching its coal outputting capacities. The record year's output (2,757,678 tons in 1916) could be greatly improved on almost immediately, provided adequate trucks and labour were available. It is somewhat surprising to find that even to-day one-third of the coal handled at the port is delivered to ships by such primitive methods as basket-carrying, and the bin at the Point which has 10,000 tons' capacity is quite unworthy of the premier coaling port of the Union. The transporters at the Bluff, too, are insufficient. One can foresee the day—and it is not far distant—when Durban will require a storage capacity of 100,000 tons, or even a quarter of a million tons of coal, and mechanical devices sufficient to handle at least 50,000 tons a day. At present the coal trade is being merely toyed with, and masters of ships after waiting in Durban for days for coal which does not materialise express bitter disappointment at the delays. It cannot be too strongly urged that the future of Natal coal is wholly wrapped up in the export and bunkering trades. The demands within the Colony itself are not great. There are no large power projects or miles of gold mines continually requiring fuel as there are in the Transvaal. For this reason it is highly essential that Natal should foster and build up her overseas coal trade; she can never hope to compete with the Transvaal for the gold industry's custom. But the markets of the Southern Hemisphere lie at Natal's feet if only the Government will help her to capture them and if too the colliery companies will only come to some practical working agreement amongst themselves and not dissipate their energies in endless bickerings and destructive rivalry. Your Special Commissioner has been at great pains to understand thoroughly the present position and future prospects of the Natal coal trade, and he has been greatly interested in the various arguments put forward by those who stand for pooling of output and those who are opposed to it. It appears to your Commissioner that the Natal Coalowners' Association exists only in name; there is no unanimity of policy such as is secured by the Transvaal Coalowners' Association. This perhaps is not to be wondered at when one considers that Natal coals are less uniform in composition and in calorific values than Transvaal and Free State coals and that the seams are of more varying widths. Some colliery owners are all in favour of pooling and grading, and in this attitude they are supported by the Railways and Harbours Administration. Other companies submit that it is an unfair handicap to have to mix their coals with products of inferior value. One gentleman representing large coal and shipping interests informed me the other day that he had to put the products of 19 different collieries into the bunkers of one ship. There is, of course, much to be said for and against each side of the question, but it seems very clear that until these opposite views can become reconciled Natal coal will always labour under a very severe handicap in regard to the marketing of the product.

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A NEW SOUTH-WEST FLOTATION—SPENCER BAY DIAMONDS.

AN exceptionally favourable diamond market is responsible for a new flotation styled The Spencer Bay Diamond Mining Co., Ltd., which has just been formed to exploit a block of ground in the Spencer Bay diamond fields of the South-West Protectorate. The area lies some 60 miles north of Luderitzbucht and was discovered soon after the larger and more southerly fields had been pegged out, but being less favourably situated for immediate development than the Luderitzbucht fields the Spencer Bay area had perforce to await its turn for a share of public favour and attention—as is usual in the case of mineral discoveries slightly distant from the main centre of attraction. After the recent wonderful rise in the price of diamonds it is not surprising that keen attention has, since the declaration of Peace, been directed towards the South-West diamond regions, and one may expect the industry to receive a big impulse in the near future by the opening up of big diamondiferous areas which have for long been known to exist north of the Luderitzbucht fields. A block of claims in one of the best of these areas has been acquired, we are informed, by the Spencer Bay Diamond Mining Co., Ltd. The capital of the concern is £25,000, of which £10,000 is set aside as working capital, whilst £15,000 in shares goes to the vendors for their property, consisting of 19 fields equal in area to 380 acres, the whole of which is said to be covered by gravel varying in thickness between 18 inches and 8 ft. The fields are situated about two miles from the sea, which is favourable from a working standpoint as the sea water is used for washing operations. Most of the more southerly fields, including Pomona and Bogenfels, are much further than this from the coast, and the same applies to the Conception Bay diamond fields. The Spencer Bay Company's fields adjoin those known as the Hansa block, now being worked by the Diamant Aktien Gesellschaft, and the gravel is declared to be all of the same description and value. The Hansa block is stated to be yielding at the present time about 70 carats per 100 loads, a value equal to some of the better areas near Luderitzbucht. The Spencer Bay diamonds average about 7 to the carat and the value 40s. per carat, which compares very favourably with the present yield of Kolmanskop, which we understand is paying handsomely in spite of its average having fallen from 6 to 12 stones to the carat, owing to the inclusion of smaller grade gravels. The quality of the Spencer Bay diamonds is said to be unsurpassed in the South-West regions, the stones being nearly all very white and brilliant. There is, in other words, practically no rubbish, a feature which applies equally to the more northerly Conception Bay fields. According to the estimates formed, the lowest average thickness of the gravel over the company's ground, if taken at 18 inches, would yield in round figures 4,000 loads per acre, or 1,520,000 loads over the entire block. The yield in diamonds is expected to equal that of the Hansa fields (70 carats per 100 loads), but taking a lower computation (50 carats per 100 loads) the area may contain 750,000 carats of diamonds. It is calculated from the Hansa working costs that 20s. per carat will cover both working costs and Government dues, leaving the company a profit of 20s. per carat. It remains to be seen how near or wide of the mark these figures will prove to be, but the promoters of the company appear to be very confident of a bright future for the concern. When it is remembered that the early work of the Kolmanskop, and Stanch's, and other Luderitzbucht fields yielded as much as 200 to 300 carats per 100 loads, the yield expected from Spencer Bay gravel is nothing extraordinary and can undoubtedly be obtained at selected spots in any of the northern fields known severally as Oyster Klip, Spencer Bay and Conception Bay. The property has been favourably reported on by Mr. J. H. De Meillon (of the Weiss-De Meillon Syndicate), who has been associated with the South-West diamond fields since their inception. Mr. De Meillon says: "I can strongly recommend these fields as a good diamond-producing proposition." The expert's report, also the contracts and other papers lie for the inspection of shareholders at the offices of the Secretary, Mr. J. S. Richardson, 151 New Stock Exchange. The directors are: Senator the Hon. J. C. Krogh (late Administrator of Swaziland), and Messrs. F. O. Nelson, J. Gassner and J. J. Bosman, of Johannesburg. The solicitors are Messrs. Steytler, Grimmer and Murray, Consolidated Buildings, Johannesburg.

Rooiberg Minerals.

The report of the Rooiberg Minerals directors for the quarter ended 30th September, 1919, shows that: Days (24 hours) worked, mill nil, treatment plant 84·21; stock slime and sand re-treated, 5,949 short tons; alluvial—tons sluiced, 12,016 short tons; concentrates produced, 35 long tons; average assay value of concentrates, 59·49 per cent. M.T.; estimated revenue, £5,307; expenditure, £11,942. The total ore accumulated at 30th September, 1919, was 7,816 short tons. It is expected that crushing will be recommenced for a period about the end of the year.

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A SHAFT TWELVE MILES DEEP TO COST £5,000,000!

The Hon. Sir Charles Parsons, K.C.B., F.R.S., in the course of his Presidential Address before the British Association the other day said: As to possible new sources of power, I have mentioned molecular energy, but there is another alternative which appears to merit attention. In my address to section B. in 1904 I discussed the question of sinking a shaft to a depth of twelve miles, which is about ten times the depth of any shaft in existence. The estimated cost was £5,000,000, and the time required about eighty-five years. The method of cooling the air-locks to limit the barometric pressure on the miners and other precautions were described, and the project appeared feasible. One essential factor has, however, been queried by critics. Would the rock at that great depth crush in and destroy the shaft? Subsequent to my address, I wrote a letter to *Nature*, suggesting that the question might be tested experimentally. Professor Frank D. Adams, of McGill University, Montreal, acting on this suggestion, has since carried out exhaustive experiments, published in the *Journal of Geology* for February, 1912, showing that in limestone a depth of fifteen miles is probably practicable, and that in granite a depth of thirty miles might be reached. Little is known of the earth's interior at present, except by inference from a study of its surface, upturned strata, shallow shafts, the velocity of transmission of seismic disturbances, its rigidity and specific gravity, and it seems reasonable to suggest that some attempt should be made to sink a shaft as deep as may be found practicable at some locality selected by geologists as the most likely to afford useful information. When we consider that the estimated cost of sinking a shaft to a depth of twelve miles, at present-day prices, is not much more than the cost of one day of the war to Great Britain alone, the expense seems trivial as compared with the possible knowledge that might be gained by an investigation into this unexplored region of the earth. It might, indeed, prove of inestimable value to science, and also throw additional light on the internal constitution of the earth in relation to minerals of high specific gravity. In Italy, at Lardarello, boreholes have been sunk, which discharge large volumes of high-pressure steam, which is being utilised to generate about 10,000 h.p. by turbines. At Solfatara, near Naples, a similar project is on foot to supply power to the great works in the district. It seems, indeed, probable that in volcanic regions a very large amount of power may be, in the future, obtained directly or indirectly by boring into the earth, and that the whole subject merits careful consideration.

Alluvial Tin in Portuguese East Africa.

A contract has been signed between the Mozambique Company and the Manica Tin Trust, granting the latter all the mineral rights in an area of 300 square miles in the Chimoio district. Alluvial tin will be immediately exploited, and ten tons of concentrates are being shipped to New York aboard the "Hypatia."

Standard Bank Interim Dividend.

The Standard Bank of South Africa has declared an interim dividend of seven shillings per share, subject to income tax. The directors' report states that the Bank's investments stand in the books at less than the market value on June 30, and amount to £4 359,139, cash £11,157,299, bills discounted £26,647,329, deposits £46,305,592.

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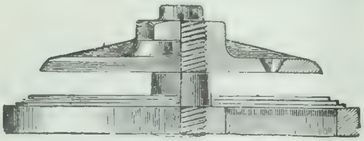

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BWANA M'KUBWA COPPER MINE—NORTHERN RHODESIA.

[By E. M. Weston.]*

This property is situated on the Katanga Junction railway, about 100 miles north from Broken Hill and about 30 miles from the border of the Congo. The outcrop of the ore body runs along the top and east side of a kopje, about half a mile long and 100 ft. high. This kopje is of a rock locally known as sandstone; but is probably a porphyry with quartz ground mass and felspar crystals. This shows green stains of malachite, and above ground level is leached and carried 2 per cent. to 3 per cent. copper. The ore body is about 1,600 ft. long, reef to 100 ft. in width. As the water level is 240 ft. below ground level, leaching and in places secondary enrichment, has been much in evidence, and a central richer vein has yielded those well-known beautiful specimens of mamillary malachite. Towards water level bornite, high grade chalcopyrite and grey copper ore begin to appear, and below water level these ores prevail. The central ore body has been largely stoped, and about 50 000 tons of ore averaging about 12 per cent. copper have been milled. This was roughly hand-picked and concentrated on jigs and Wilfley tables in a small 100 ton a day mill. Owing to the character of the ore over 50 per cent. of the copper was sent to the dump in the slime and sand. A concentrate of 40 per cent. copper was calcined and sent to Europe. High rail freights and the expense of coke and fluxes make smelting locally the bulk of the ore body, which has a value in the vicinity of 5 per cent. copper, almost impossible and the problem presented itself of making available the large tonnage of copper in this ore body. Oil flotation in the hands of the Mineral Separation Company has made great progress in dealing with many classes of ore not generally considered suitable for this process. Exhaustive tests were made in London with flotation, and as a result a process was devised which gave excellent results with large parcels. Following this, the small mill has been remodelled, a Hardinge mill installed for fine grinding and a flotation unit added, with which bulk trials of the mine ore are being made. It is expected to make a concentrate going over 20 per cent. copper. It is not stated what process is being employed to make the malachite float. I am indebted to the manager, Mr. Wiley, for a most courteous reception and these notes which I trust will prove of interest to readers. The concentration of low grade oxidized ores of copper has always presented an insoluble problem unless leaching processes were practicable and the success of flotation methods for this class of ore is of great interest and importance. Perhaps Mr. Wiley will be able to give fuller particulars at a later date.

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* Paper read before the C.M. and M. Society of South Africa.

A Chemical Entente.

At the recent annual meeting of the Association of British Chemical Manufacturers it was announced that a friendly understanding had been come to between the British and French chemical industries for co-operation in international development. The British Association now represents £70,000,000 of capital invested, and continued rapid growth in the department of dyestuffs and fine chemicals is assured. The importance of chemical progress in its relation to industrial efficiency and the life of a nation cannot be over-estimated, and everything possible will be done to hold and extend the amazing advance made by Great Britain in response to the necessity for sudden development during wartime.

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Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

"Far East Rand, Mines and Shares."

Mr. W. E. Bleloch Replies to Our Criticisms.

To the Editor, *S.A. Mining and Engineering Journal.*

Sir,—Just a brief word on the concluding remarks in your review on my book, "The Far East Rand: Its Reefs, Mines and Share Values." I am grateful to your reviewer for the fair and reasonable criticism of the greater portion of the review, but the "cudgelling" at the end—mild cudgelling, I admit—is just where the usual injustice comes in. To take your reviewer's reference to Modder East—how long has it taken the "Houses" concerned to bring that property to "a successful stage," and how much money have the unfortunate shareholders in Rand Klip and Cloverfields lost in the process? The answer is, over 20 years and not less than £2,000,000 of money lost by buying the shares at their early inflated prices. I remember being allowed as a favour by Neumanns to have 300 Cloverfields at £3 just after the Boer War. It must be admitted that the properties now held by the Modder East have a long and disastrous record of development behind them. Both Rand Klip and Cloverfield failed to establish pay values, and the Government boreholes put down on the leased area, all five of them, showed unpayable values, the highest according to the Government Mining Engineer being under 5 dwts. Even Modder B. had a similar record, and was shut down as unpayable for several years. The estimates for the Nigel Van Ryn Mines are not, as your reviewer states, based on the small tonnage so far developed on the Nigel Reef in that mine, but on the known character of the Nigel Reef in other mines in the district—Daggafontein, Nigel and Sub-Nigel, for instance—just, as I take it, the present market price of Springs West shares is based not on the unpayable development showing values of only 2 to 3 dwts. for two quarters of this year, but on the known character of the Van Ryn Reef. To write, therefore, in that strain about our properties while winking the eye at the giant flotations whose only justification must be based on precisely similar estimates of values as those shown in my book, without a word of comment, savours of financial hypocrisy! What justification is there for the flotation of Spaarwater with a capital of £1,700,000? What justification was there for Modder Easts being 20s. two years ago, or for their being 34s. now, save just such estimates? Will your reviewer put down in plain figures, as I have done, the bases of their justification? The comments of your reviewer which I now complain of are similar in every way to other comments in the *Financial Times*, dealt with in my book, about which your reviewer says nothing, and they have the effect of helping the conspiracy—one can call it nothing else—which obviously exists to keep down the market price of our shares, ordering the public off our mines and into the mines (at often inflated prices, as my book shows) of the Corner House; the plain object being to hinder us in getting the capital necessary to attain the big scale development your reviewer demands. It is to help to break this conspiracy that the book was written and that the course of lectures I am about to give in the United Kingdom and France is being undertaken. Meantime Southern Van Ryns have over £80,000 cash resources, sufficient in any case on our careful and frugal methods to bring the mine to a producing stage, and that before the end of next year. Nigel Van Ryn is already producing. In conclusion, I invite your reviewer to come and hear my lecture on Wednesday evening, the 29th inst., at 8 o'clock, in the Selborne Hall. Thanking your reviewer for his review, even if towards the end he has no doubt unwittingly taken up a mistaken attitude.—Yours, etc.,

W. BLELOCH.

Johannesburg,
October 21st, 1919.

Zambesi Coal Developments.

A financial group connected with the Mozambique Company, the British Central African Company, and the railways has acquired the control of the Zambesi Mining Development Company. This company, which has a capital of £252,000, holds the exclusive concession of the mining rights over an area of more than 25,000 square miles, situated mostly on the northern side of the Zambesi river between the 30th and 35th meridians of east longitude (roughly from the Rhodesian border down to Sena), but also including a very important tract of territory south of the Zambesi. The exclusive mining rights are conceded until 1940, but all the mines discovered and registered become the perpetual property of the company. The coal concession formerly held by the Companha Hulheira da Zambezia having lapsed, it is the intention of the new group to pursue an active policy of exploitation. The coal deposits within the area affected are very extensive, the length of the basin being estimated by the Imperial Institute at about 170 miles. The indications furnished by the outcrops, particularly along the Moatize river, where a seam of good-quality coal 20 ft. thick is exposed, are very promising; but the full extent and character of the deposits have still to be determined, and the intention is to make a thorough investigation of the whole of the mineral resources of the region. Meanwhile the exploitation of the most accessible and best-paying coal deposits will be put in hand at once under the direction of competent engineers. The coal worked from the Moatize deposits can be conveyed to the Shiré Highlands Railway by river transport down the Zambesi or by a small narrow gauge line. Still nearer are the Sinjal coalfields, only twenty-two miles from the Shiré Highlands Railway.

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THE ORIGIN AND HISTORY OF THE RAND CONGLOMERATES.

Placer vs. Infiltration Theory—Why Some of the Banket Beds are Richer than Others !

In the course of a long and highly interesting lecture on the origin and history of the Rand conglomerates, at the School of Mines, Prof. R. G. Young quoted the following from a letter received by him from a prominent British geologist, written after the publication of Prof. Young's book on the banket: " I am very glad to see that you definitely rank yourself among the placer theorists. I have never been able to see that the infiltration theory had good foundations. Those who upheld it seemed to me to give exaggerated importance to rather trivial details, which could quite well be otherwise explained." Prof. Young continued: " There still remains to be discussed a rather interesting and important point in connection with the distribution of gold in the Witwatersrand system. While all the conglomerates in the system are to some extent auriferous, those of the Main Reef zone and more especially the Main Reef Leader and South Reef are distinguished not only by a much greater concentration of the gold, but also by the persistence of values over extensive areas. Why certain of the pebble beds should be thus favoured demand some explanation. Dr Mellor has pointed out that a distinguishing feature of the principal gold-bearing beds is their remarkable regularity and persistence as individuals. He has also called attention to the circumstance that those exceptional portions of the Kimberley Reef series which have proved sufficiently rich and constant in their gold contents to warrant working, have been distinguished from the bulk of the Kimberley reefs by a similar regularity and persistence. Dr. Mellor is of opinion that some at least of the conglomerates of the Main Reef series were laid down under deltaic conditions, and he ascribes the remarkable regularity of the Main Reef Leader in particular to its having been very rapidly deposited during an unusually powerful flood. With this explanation I entirely disagree. Evenly spread beds of pebbles of uniform composition, showing distinct signs of grading, appear to me to be precisely what one would not expect to result from rapid deposition during a flood. To my mind, the features just mentioned of the Main Reef Leader as well as its richness point to its having been deposited during a period of well-balanced and long maintained conditions, during which the slowly extending beds of gravel formed a natural trap for fine gold. On the other hand, the conditions prevailing during the deposition of the bulk of the conglomerates comprised by the Kimberley and Elsburg series were such that the beds were irregularly and rapidly deposited and as rapidly covered over by other beds. Such conditions would be unfavourable to the concentration of gold in the beds, but where, locally, the conditions were better balanced and approached those under which the Main Reef Leader and South Reef were laid down, the beds would not only be more regular and persistent but also richer. This appears to me to be in outline the true explanation of why certain of the conglomerate beds in the Witwatersrand system are richer than others."

The Engineers' Directory.

Excellent progress is being made with the preparation of the S.A. Engineer's, Electrical and Allied Trades' Directory, which is now in the press. To ensure the utmost accuracy and completeness a vast amount of work has been entailed, and the book in its final form will be a complete directory of the firms engaged in the engineering, electrical and allied trades, *plus* a list of the personnel of the mines, railways and municipalities throughout the Union and Rhodesia. Firms who have not yet returned the forms sent to them are earnestly requested to do so without delay. In some cases firms have sent in the lists of their specialities for the Buyer's Guide Section without signing them, and it would much simplify the work of compilation if firms conscious of having made this omission will communicate the fact to the Publishers, care of this journal.

* * * *

Enlarging the Mining Field.

An editorial in the current number of the *Mining Magazine* suggests two methods of providing additional work for the mining engineer and of increasing the importance and influence of the profession. In the first place, the mining engineer may turn his studies to the design and manufacture of plant and material required at the mine or metallurgical works; and second, he may follow the mineral or the metal further than the mine or smelter and engage in metal manufacture or the production of commercial chemicals. These industries are at present out of the official scope of the mining engineer and metallurgist, for they are not included within the purview of the mining schools, and engagement in them does not qualify for the membership of the mining societies. Nevertheless many mining engineers and metallurgists, as well as owners of mines and smelters, have crossed the strict line, greatly to their profit. At the present time there is some prejudice against the mining engineer becoming a manufacturer of machinery. Such mining engineer has, quite against his own wish, to adopt some sort of camouflage in his capacity as manufacturer, in order that he personally shall not be mistaken for a tradesman. Surprise is expressed by superior people when it is found that a builder of head-frames is an Associate of the Royal School of Mines, or that a maker of rock-drills is a Member of the Institution of Mining and Metallurgy. Our contemporary's view is that the making of plant and materials used at mines and metallurgical works is advantaged by the direct influence of men conversant with the objects for which the plant is used, and young mining engineers are therefore advised to note the opportunity offered by the careers here indicated. " In considering the possibilities of participation in the profits arising from the handling of mine products it has to be remembered," our contemporary continues, " that the mining engineer's and metallurgist's business is supposed to end with the selling of the mineral or the metallic ingot. The copper and lead smelters in this country, when their supplies of ore ran short, generally turned their attention to the manufacture of pipes, sheets, wire or white lead. Some of the copper smelters in America are extending their business in the same direction, but without waiting for the exhaustion of their ore supplies. In America and Australia the zinc producers are making galvanised iron, and many are engaged in the manufacture of zinc and lead pigments. The controllers of the chrome ore output no longer part entirely with their raw material at the beggarly price that used to be offered by the chemical manufacturers, but share the latter's profits on a sound businesslike basis. One of the companies owning wolfram mines is now producing tungsten powder from its own concentrate instead of selling its raw material on the open market. A big producer of bismuth minerals has its own works for the production of bismuth alloys and chemical compounds. The talc industry in the Transvaal has been made profitable by the manufacture of marketable articles instead of practically giving it away to people that wanted it. In Rhodesia a producer of arsenical ores is selling cattle dip in the local market. Certain firms of antimony smelters make antimonial pigments. The above examples show what has already been done, and indicates the general line of expansion to which we refer. The policy is capable of wide and increasing application. There are difficulties in the way, of course, due to the opposition of the middleman trader, and to the secrecy surrounding the processes and methods. It is just these obstacles that give zest to the attack, and in the case of the disposal of mineral products the ruinous prices offered by the middleman afford excuse for the attack on other people's businesses. It is not necessary here to give specific instances of possible chances of increasing mining profits by embarking in manufactures based on the products of the mine; though one case may be mentioned, that of the gold producers, who might be enabled to put their financial position in better order if they were empowered to participate in the manufacture of jewellery, gold leaf, etc.

THE NATIVE LABOUR POSITION ON THE RAND.

Authoritative Review of the Year—Questions at Issue—Serious Shortage and its Causes.

The seventh ordinary general meeting of the Native Recruiting Corporation, Ltd., held last Monday was made the occasion of an authoritative review of the native labour position by the Chairman, Lieutenant-Colonel C. W. Villiers. He said the total number of natives engaged by mines members of the Corporation during the year ended June 3rd was 176,037, as compared with 178,966 for the year ended 30th June, 1918, the average number of natives in the employ of members being 151,827, as against 153,162 in the previous year. The total expenditure of the Corporation for the year ended 30th June, 1919, was £320,784, as compared with £365,786 during the previous year, and the cost per annum of each unit of strength in the employ of members as a whole works out at 42s. 3d., as compared with 47s. 9d. for the year ended 30th June, 1918. For the purpose of making this comparison in the cost of native labour the natives employed by the Langlaagte Estate and Randfontein Central G.M. Company have not been included, as recruiting for these companies by the Corporation only commenced on June 1st, 1919. A further increase in the number of voluntary labourers coming to the mines has to be recorded. During the period under review, out of a total of 117,373 natives from British South Africa, 56,377 were voluntary natives, representing 48.03 per cent., as compared with 49,743 voluntaries, out of a total of 115,236, or 43.16 per cent., during the previous year. The supply of labour during the year has again been inadequate, the underground strength having averaged only 69.47 per cent. of the total underground complement of members—a considerable decrease as compared with the preceding year, when the average underground strength was 74.92 per cent.

The Influenza Epidemic.

Among the contributory reasons for this further shortage of native labour must be included the serious epidemic of influenza, which commenced in September, 1918, and also the competition for labour by other industries. Owing to the influenza epidemic, recruiting was practically at a standstill during the months of November and December. The total number of cases reported on the mines was 52,489, and the number of deaths caused by this disease was 1,082. The comparatively low rate of mortality from this cause reflects great credit on the medical and hospital organisation pertaining generally to the mines of the Witwatersrand. In the Native Territories the epidemic was very severe, and the total mortality among British South African natives has been estimated by the Government at over 80,000. Your Corporation did all that was possible to assist in combating the disease, and with the co-operation of the South African Railways special facilities were provided on the native trains whereby any native taken ill on the journey to or from his home could immediately receive medical attention. Further, soup kitchens were established at various points along the railway, where natives, whether mine natives or not, received free issues of hot soup, etc. In connection with the assistance given by the Corporation, special thanks are due to Dr. Young, the Medical Officer at the Strerkstroom Cleansing Station, who was untiring in his efforts to alleviate the sufferings of the sick natives in various districts of the Native Territories. The Sterkstroom Cleansing Station has continued to operate during the year, and about 53 per cent. of the British South African natives recruited for the mines have passed through the station. The whole question of continuing this station is under consideration at the present time, and it is probable that other arrangements will shortly be made whereby all British South African natives coming to the mines will have the benefit of passing through a cleansing station before commencing work. Though the system may at first appear irksome to the natives, I am sure that in a very short time they will realise the benefit of such a system which must tend to add to their personal comfort During the year, though there has been a considerable amount of typhus in the Native Territories, only three cases occurred in one compound on the mines. This outbreak being immediately taken in hand, any further progress of the disease was averted. Inoculation of natives with Dr. Lister's anti-pneumonia vaccine is being carried out on all the mines members of the Corporation. The natives, though submitting to the inoculation, do not like it, but here again it is only a matter of explaining the necessity of this treatment, and of educating the native mind to realise that the inoculation is entirely in their own interest in order gradually to overcome their objections.

Health Conditions.

Apart from the influenza epidemic, the health of the natives has been good. The total number of working days lost per 1,000 natives employed per day on all the gold mines of the Witwatersrand was 9·597 from sickness, and if the influenza cases are excluded the total loss from sickness yas 7.54 days per 1,000 natives employed per day, as compared with 6.85 for the year ended 30th June, 1918.

Deferred Pay.

The system of voluntary deferred pay has been fairly well received by the natives, and during the financial year 17,548 recruits, equal to 29.7 per cent., of all recruited British South African natives availed themselves of the system. So far this system has not been adopted to any extent by voluntary natives, but it is hoped that in time they will realise the benefit to themselves of saving their money. At date natives' deferred pay, amounting to approximately £49,000, has been invested in Treasury Bills, the interest on which will be devoted to promoting and assisting such native institutions as the Board of Control may decide. Your Board has now adopted a scheme whereby moneys deposited by natives on the mines for safe keeping will be handed over to the Corporation, and invested in the same way as the deferred pay is invested under the control of the Deferred Pay Board. During the year natives remitted a sum of £65,278 to their homes through the Corporation's Agency, being an increase of £12,220, as compared with the previous year. The number of Remittance Orders dealt with was 16,526, an increase of 2,673, as compared with the year ended 30th June, 1918.

Competition for Labour.

With reference to the competition for labour from industries other than the mining industry, there is no doubt that many natives who would otherwise come to the mines of the Transvaal are being attracted to more congenial work on the surface, such as sugar estates, railway and road construction. As other industries spring up and become developed this competition will no doubt increase, and I think it has been conclusively proved that other sources of native labour supply must be tapped, as British South Africa cannot provide a sufficient supply of native labour for the mining, farming, and other industries. In the recently-published interim report of the Low Grade Mines Commission the Government have been recommended to grant permission. for the resumption of recruiting operations in the areas north of latitude 22 degs. S., and it is hoped that they will give effect to this recommendation at an early date. As you are aware, for some years past a bonus has been offered to underground natives to induce them to renew their engagements on the mines at the expiration of their contracts, but this has not proved a success. Your Board, therefore, now have a scheme under consideration which it is hoped may have the effect of maintaining a larger supply of native labour on the mines, and at the same time improving the efficiency of the native workers. Briefly, the scheme is that some means should be found which will induce natives to remain for a shorter time at their homes between their periods of work on the mines. It is estimated that natives must, after working on the mines, remain at home on an average for at least six months. If this period could be reduced to approximately three months it follows that not only a considerably greater native labour strength could be maintained on the mines, but that the efficiency of the labourers would also be increased.

More Scope for the Native.

The great drawback to the native endeavouring to make himself more efficient still exists, namely, the little scope offered to him to improve his position and wage-earning capacity. Considerable evidence on this point was laid before the Low Grade Mines Commission, but the Commission had not sufficiently examined the evidence when their interim report was presented to bring forward any recommendations on the subject.

Native Unrest.

There has been evidence during the year of a certain amount of unrest among the natives, both on the mines and among those in other employ, and this was on the point of developing when during the months of March and April serious trouble arose amongst natives employed on other than mine work in the various municipalities on the Witwatersrand. This trouble arose through a desire by natives for a general increase in wages, and was instigated by educated natives, who professed to be the leaders and representatives of the native workers. These self-appointed leaders of the natives had, since the 1st July, 1918, been agitating for a general increase in native wages, and finding themselves unable to bring this about in any direct manner they advised all natives to return their passes to the Government offices, and to decline to take out fresh ones. On the 19th March, just prior to these agitations taking any concrete form, the Johannesburg Branch of the Transvaal Native Congress wrote a letter to this Corporation, requesting an interview on behalf of native workers for increased wages on the mines. Anticipating trouble, it was deemed advisable to send for representative native chiefs and headmen from various parts of British South Africa, for the purpose of preventing the spread of any influence the members of this native Congress might have with the native workers on the mines. A very representative gathering of native chiefs in Johannesburg was the result, and the presence of these real representatives of the natives no doubt went a long way towards preventing the disaffection spreading to the natives on the mines. The disaffection in the municipalities was accompanied by serious rioting, and many collisions with the police. The action of the Corporation in sending for the native chiefs to come to Johannesburg was very strongly resented by the members of the Johannesburg Branch of the Transvaal Native Congress. Mr. Taberer, your General Manager, considered it advisable to endeavour to have a private meeting with the latter body, which he accordingly arranged, and held on the 29th April. Mr. Taberer was able to bring reason to bear on the members of the Congress, some of whom, from their speeches, made it very clear that they were preparing for serious trouble, and from the date of the holding of the meeting the natives ceased to openly refuse to take out or carry passes. It is understood that full investigation is being made by the Government into the general question of the Pass Laws, with a view to the amelioration of any hardships under which the natives may be labouring. During the year under review negotiations were opened with the Randfontein Group of Mines, with a view to that Group and their associated mining companies becoming members of the Corporation. Though the actual agreement has not yet been signed, the Randfontein Group decided not to renew their existing arrangements for the supply of native labour to their mines, and the Corporation commenced recruiting operations for the Group in June last. The addition of this Group to our list of members is most welcome, and will, I hope, be beneficial both to the Group itself and also to other members of the Corporation. It is with great regret that we have to record the death of the late General Louis Botha, Prime Minister of the Union, and Minister of Native Affairs. The loss of this great South African statesman will be deeply felt all over the British Empire, and not least by the native population of South Africa, to whom he was a kind friend and just administrator. As mentioned in the report, nearly all the members of the staff who were on active service have now returned, and resumed their duties with the Corporation. I have to express our deep sympathy with the relatives of Lieutenant E. A. Persse, R.F.A., who was killed in action in France just prior to the Armistice. It is with regret that I have to record the death of Mr. Dower, Secretary for Native Affairs, and also of his successor in office, Mr. Moffat. Both these gentlemen were very valuable officials, and their death is a great loss both to the Government and to the public. Your staff, both in the Head Office and in the Native Territories, have continued to render most loyal service, and your thanks are due to them. On behalf of the Corporation, I wish to thank the various Government departments, especially the Native Affairs Department and the Department of Public Health, for their assistance during the year. Your thanks are also due to the Chamber of Mines, the Witwatersrand Native Labour Association, Limited, the Advisory Committee of Consulting Engineers, and to the mine managers and compound managers. I should also like to take this opportunity of expressing both my personal thanks, and also the thanks of the Corporation, to Mr. F. G. A. Roberts, who so kindly volunteered to carry on the duties of chairman of the Corporation during my absence on active service.

Barberton Mining.

In the annual report of the Union Department of Mines and Industries for 1918, Mr. T. G. Trevor, of the Pretoria Inspectorate, reports on the Barberton district as follows:—Gold: The gold output for the Barberton district was 45,091·778 ozs., valued at £191,540, as against 58,252·247 ozs., valued at £247,440, in the previous year. This falling off of 13,160·469 ozs. is entirely due to the closing down of the Sheba Mine and the fall in output of the Worcester Mine. The gold produced by the smaller mines having increased from 1,919·190 ozs., valued at £8,151, to 2,527·800 ozs., valued at £10,739. Magnesite: The value of the magnesite produced by Mr. Budd, the one producer at Malelane, remains constant at about £2,000 per annum. Arsenic: The Consort Mine produced 10·5 tons of white arsenic, valued at £1,030, which was recovered from condensation chambers attached to the furnace in which the auriferous concentrates are roasted. Inquiries are continually being made by manufacturers for a supply of white arsenic, but so far I have been unable to find anyone with knowledge of a satisfactory arsenical deposit. It is highly probable that such exists, but, as no value has ever been attached to arsenic, if any prospector has come across it he has neglected it. It must be remembered that there is no "arsenic mine" as such *per se* in the world, and that in the past arsenic has never been won as the principal output of a mine, the amount recovered as a by-product for metallurgical works having been sufficient to supply the demand. Of late years, however, the demand for this mineral, as a basis for stock dips and for insecticides generally, has increased by leaps and bounds, and it is probable that the price, for at any rate many years to come, may remain at a figure which will repay direct production. Roads: Every year it becomes more obvious that the development of the outside districts is enormously hampered by the lack of decent roads. The making of roads is a function of the Provincial Government, and in each district Road Boards are appointed from the local inhabitants to allocate the expenditure of certain sums which are granted to the district by the Provincial Government for the upkeep of roads. These sums are, however, totally inadequate to do more than to keep the roads passable for agricultural ox wagons and similar light traffic.

THE WEEK IN THE SHAREMARKET.

A Strong and Active Beginning, Followed by an Easier Tendency.

A natural reaction took place in the market this week, and prices on the whole were slightly easier. As one broker put it, buying was easier than selling and there seemed a more distinct tendency to wait upon London. In London diamond shares seemed to be chiefly in demand, and the diamond syndicates here enjoyed a season of favour. Prices of gold stocks remained firm on balance, though fluctuations were more marked than in the preceding week. The Pretoria Portland Cement issue of new capital was well received; and the new diamond syndicates, like Stienies and Deepwaters (dealt with in these pages some weeks ago), were conspicuous features. Thursday opened actively, and a large amount of business was done before High 'Change. Anglo-Americans were bought at from 39s. up to 40s. 6d., E.R.P.M. at 8s. and 8s. 3d., Bushveld Tins at 2s. 8d. and 2s. 9d., Stienie Diamonds at 7s. 9d., and Coronation Freeholds at 2s. 11d., 2s. 10d., and 2s. 11d. in large numbers. On the Call prices were irregular. State Mines were 1s. higher at 98s., sales and buyers; Modder East Debentures, 50s. up at £252 10s. sales; the three-year Modder East Options 3d. up at 13s. 6d. sales; while the shares and four-year Options were slightly easier; Coronation Freeholds 6d. higher at 2s. 11d. sales; Anglo-Americans, 1s. 9d. higher at 40s. 3d. sales and buyers; West Springs, 6d. at 27s. 6d. sales, and the Options 3d. at 10s. 9d. sales. Odd lots of New Modders were dealt in, but the prices realised for them, £29 15s. and £29 12s. 6d., were slightly higher. Modder B., with sales at 180s. and 179s. 6d., were unchanged, but Modder Deeps were a little lower at 49s. 6d. sales, and Springs Mines were the turn better at 57s. sales and buyers. Gedulds were 1s. 9d. lower at 60s. 6d. and 60s. sales, the Options 1s. 3d. down at 20s. sales. Langlaagte were distinctly lower at 21s. sales. Dagga Mines were 6d. down at 23s. sales and sellers, Sub Nigels 3d. at 23s. 3d. to 23s. sales, etc. Pretoria Cement were 1s. 6d. lower at 94s. sales and buyers, and S.A. Alkali also 1s. 6d. down at 36s. sales. Leeuwpoort Tins were lower at 30s. sales and sellers, Bushvelds 3d. down at 2s. 7d. sales, Zaaiplaats and Rooiberg inactive. De Beers Deferred were bid up 15s. to £26 5s., and Premiers Deferred about 20s. to £11 buyers, but without result in either case. New Elands were easier at 47s. 6d. sales of an odd lot. Union 5 per cent. Loan was obtained at £105 and the Taxable Loan at £101. The market eased off as the day wore on. The week's changes were as follow:—

	Fri., 17th.	Sat., 18th	Mon., 20th.	Tues., 21st.	Wed., 22nd.	Thurs., 23rd.
African Farms	16 1½	16 0	16 3	15 9*	15 9	15 7†
Anglo Am. Corp.	35 6	34 3	38 6	39 6	38 6	40 3
Apex Mines	7 9*	7 6*	7 1*	7 6*	7 6*	7 6*
Aurora Wests	8 6*	8 6*	8 0†	8 0†		7 6*
Bantjes Cons.	3 6*	3 6	3 6*	3 6*	3 9†	3 6
Brakpan Mines	77 0†	76 0†	76 0*	76 0	76 0	75 0*
Breyten Collieries	8 0*	-	8 0*		8 0*	
Brick and Potteries	4 6*	4 6*	4 6*	4 6*		
British S.A.	23 0*	23 0*		22 0*	21 0*	21 6*
Bushveld Tins	2 1	2 1	2 3	2 2*	2 10	2 7
Cassel Coals	—					32 6*
Cinderella Cons.	5 6*	5 6*	6 0	5 0*	5 0*	5 0*
City and Subs.	9 9	9 0	9 0	8 6*	8 6	8 3*
City Deeps	65 9*	64 3	63 6	63 0*	62 3*	63 0
Clydesdale Collieries	28 0*		28 3*	—		
Con. Investments	33 0*		34 0†			
Con. Langlaagtes		24 0	23 6	24 6†	24 0†	21 0
Con. Main Reefs	13 6	12 6	12 6	12 0*	12 0*	11 9*
Con. Mines Selection.	28 6†	28 6†	28 6†	29 6†	28 6†	27 6*
Coronation Freeholds.	2 1	2 1	2 3	2 4*	2 5*	2 11
Coronation Syndicates	4 0				5 0*	5 0*
Crown Diamonds	10 0*	9 9	9 9*	10 0†	9 6	10 0†
Crown Mines	69 0	67 6	67 6		64 0*	65 0*
Do. Debentures	£102*	£102*	£102*	£102*	£102*	£102*
Daggafontein Mines.	24 6	24 3	24 3	24 6	23 6	23 0
Do. Opts. (5 yrs.)	8 9	8 0	8 3	8 3	—	8 0
Durban Rood. Deeps	10 0†	8 6*	8 6*	—	8 6*	—
E.R. Coals		2 11	3 6	2 10*	3 0	2 11*
E.R. Deeps	1 5	1 3	1 4	1 5*	1 3*	1 3
E.R. Proprietary	9 4½	8 9*	9 0	9 0	8 6	8 3
E.R. Debentures	£65*	£65*	—	£65*	£65½*	£65½*
Eastern Golds	1 7*	1 8*	1 7*	2 0†	1 8	—
Ferreira Deeps	—	7 6	—	—	—	—
Frank Smith Dmds.	7 2	7 0	6 10	6 9	6 8	6 7*
Geduld Props.	62 9	63 0	62 6	62 9	61 9	60 0
Geldenhuis Deeps	12 0†	—	—	—	—	—
Ginsbergs	—	2 0*	2 9†	—	—	2 0*
Glencoe Collieries	7 6†	6 0*	6 0*	—	7 6†	7 6†
Glynn's Lydenburgs.	14 0*	14 0*	16 6†	16 6†	16 6†	15 0*
Govt. Areas	99 6	99 3	98 3	99 6	97 0	98 0
Jhb. Bd. of Ex.	- -	33 0*	33 0*	33 0*	33 0*	—
Jupiters	5 3	5 0*	5 0*	5 0*	5 0*	5 0
Klerksdorp Props	2 0*	2 1	2 0*	2 0*	2 0*	2 0*
Knight Centrals	7 6	7 0*	7 3†	7 6†	6 3	6 4*
Knights Deeps	8 9*	—	—	—	—	—
Lace Props	23 0	22 9	22 6	22 0	21 3*	21 0*
Leeuwpoort Tins	31 3	31 0	30 3	30 6	30 9	30 0
Luipaardsvlei Est.	4 6*	5 0†	5 0	—	—	4 6*
Lydenburg Farms	9 3	9 4	9 0*	9 1	8 9*	8 0*
Meyer and Charltons	93 0†	93 0	91 0*	92 0*	92 6*	92 6*
Middelvlei Est.	–	2 6	2 6	2 5*	2 6*	2 6*
Modder B.'s	176 3	177 0	179 0	180 0	179 6	179 6
Modder Deeps	51 0	50 0	50 0	50 0	49 9	49 6
Modder Easts	34 1½	34 3	33 9	33 9	32 9	32 7½
Do. Opts. (3 yrs.)	14 9	14 6	14 3	14 3	13 3	13 6
Afr.-Euro. Invest.	17 6*	17 0*	17 6*	—	16 9*	—
Hume Pipes	21 6	21 6	—	22 6†	21 0*	21 0*
General Minings	5 6*	—		–	–	–
Natal Navig. Colls.	27 0*	27 6*	—	27 0*	—	–
National Banks	£15¼†	£15¼†	£15*	£15¼†	£15¼	£15¼†
New Boksburgs	2 3	2 4†	2 6†	2 6†	2 5†	2 6†
New Eland Diamonds	40 0	40 0	41 3	45 0*	49 0	47 6a
New Era Cons	12 3	12 0*	11 9*	11 6*	11 9*	11 9*
New Geduld Deeps	2 3	—	2 0*	2 1	2 0*	2 0
New Heriots	8 6*	8 6	10 0†	8 0*	8 0*	8 0*
New Kleinfonteins	14 9	14 0	13 6	13 6*	12 0	12 0*
New Modders.	£29¾a	£29¾	£29¼*	£29¼†	£29½a	£29¾
New Unifieds	—	6 0	6 0	5 6	—	5 9†
Nigels	8 0*	8 0*	—	9 0*	9 0*	8 6*
Nourse Mines	18 0†	16 6	17 0†	16 6	15 0	14 6*
New State Areas	33 3	33 0†	32 6a	31 3*	31 6	31 9*
Premier Deferreds.	—	–	195 0*	—	–	220 0*
Premier Preferreds	152 6	152 6*	—	155 0*	155 0*	155 0*
Pretoria Cements	98 6	100 0	99 0	99 0†	95 6	94 0
Princess Estates	3 6	3 4	3 0*	3 0	3 0	3 0
Rand Collieries	.	3 9*	3 9*	4 6†	3 6*	3 6*
Rand Nucleus	2 0	2 0	2 0*	2 0*	2 0*	2 1
Rand Select. Corp.	77 6*	77 6a	77 0a	76 0*	75 0*	75 0*
Randfontein Deeps	7 6*	7 10	–	7 6	7 0	7 0*
Randfontein Est.	27 9	27 10½	26 3	26 9*	26 3	25 9
Roberts Victors	15 3	14 9	14 9	15 0	15 0a	14 0a
Rooibergs	6 3*	6 6	6 0a	6 0*	6 0*	6 0*
Roodepoort Uniteds	3 0*	—	–	4 0†		—
Rose Deeps	16 0*	16 0*	–	–	–	
Ryan Nigels	6 0†	6 0†		–		
Shebas	2 4	2 3	2 3*			6 0†
Simmer and Jacks	5 6*	5 0*	—	5 0*	2 0†	2 6†
Simmer Deeps	2 9	2 6		2 0*	5 6†	
S.A. Breweries	40 0*		38 0*	39 0*	2 9†	2 0*
S.A. Lands	7 5	7 6	7 4	7 3*	40 6*	41 0†
Springs Mines	58 9	58 3	57 6	57 9	7 1	6 10*
Sub Nigels	24 3	24 0	23 3	24 0	57 0	57 0
Swaziland Tins	—	14 0*			23 3	23 0
South Van Ryns	8 3*	8 6*	8 9	9 3	8 9a	8 11
S.A. Alkali	41 0	41 0*	41 3*	37 0a	37 6	36 0
Tudors	1 5*	1 9		1 3*	1 6*	1 6*
Trans. Del. B. In.	80 0*	80 0*	80 0*	80 0*		80 0*
Tweefontein Colls.	25 0*	25 0*	25 0*	25 0*	25 0*	25 0*
Transvaal Lands	31 0*					
Trans. G.M. Est	17 6	17 0	17 0	16 6*	–	16 6
Union 5 per cent.	£105¼	£105¼†	—	£105¼*	£105¼	£105
Van Ryn Deeps	89 9	89 6	88 0*	89 0	89 0	89 0*
Van Dyks	4 4		4 3†	3 6	3 6	3 9
Village Deeps	16 0	15 0*		15 9	15 0	15 9
Village Main Reefs	8 9†	8 9†	9 0†	8 6†	8 6†	
Welgedachts		28 6*	25 0*	28 6*	27 6*	28 0*
West Rand Cons	7 9*	8 0		7 0*	8 6†	6 0*
Western Rand Est	8 3†	8 3†	6 6*	7 6	7 3	7 4†
Witwatersrands	24 9†	22 6†	23 0†	20 0*	–	20 0*
Wit. Deeps	10 9	10 9*	10 3	10 6*	10 0*	10 0*
Wolhuters	4 3	4 0*	4 0	4 0	4 0	4 1
West Springs	27 9	27 9	27 4½	27 6	27 0	27 6
Do. Options	11 0	11 3	11 0	11 0	10 6	10 9
Zaaiplaats Tins	7 0	7 4	7 6	7 6*	7 6*	7 6*

*Buyers. +Sellers. aOdd lots. bEx London.

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TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Business Anything but Good—Commercial Exchange—Timber and Roofing Iron—Building Trade Buoyant—Electrical Materials—Dynamite—Oils and Colours—Iron and Steel—The Trend of Things.

Business, as apart from the building trade, is exceptionally quiet. This in a measure is accounted for by the strikes, especially in America, where the steel strike at one time looked rather formidable. During that time merchants here bought freely from one another in anticipation of future shortages. Thus having secured the requisite stocks to fulfil a month or so's contracts, quite a lull has taken place, and that is the position at the moment. In consequence of this absence of business, holders of the heavier lines at the top prices are inclined to realise to prevent further losses on lines that are not in everyday use. It can well be remembered that just before the Armistice heavy oversea commitments existed and these had to bear not only the heavy original cost but the heavy shipping freight and insurances in existence throughout the whole of the war period. A portion of these highly-priced goods has been liquidated, but there are quantities on hand held by the various mining material firms. Again, when the mines are doing so little whilst they are using their reserves and also because they are working under the most economic pressure, thus creating a dulness in business, it usually happens that that is the time that holders get nervous and realise as much as possible without creating anything like a slump. Engineering and the foundries are quiet, but hopes are entertained that more work will come in, as usually happens just before Christmas. In this connection one manager explains that the Johannesburg engineering shops have to exist on repairs for the mines or breakdowns and such-like work, whereas in the older countries, such as Britain and America, when the shops are not on repair work they turn their attention to making up some line or another of standard material or machinery, and so keep themselves occupied without having to depend solely upon occasional work. This occasional work comes very expensive, because it may be a pattern has to be made for one particular job and perhaps never used again, or very occasionally. The economical phase as to the conduct of the mines is another reason for the shortage of work, also that very little new construction work is in progress owing to the shortage of natives.

Commercial Exchange.

A member reports that white lead has advanced during the week from 70s. to 84s. per 100 lbs., and not too many sellers, as stocks are very low, British white lead being practically unobtainable. Boiled and raw linseed oils are very scarce and buyers are plentiful, the English variety being practically unobtainable. Files have advanced from a discount of 7½ per cent. to plus 15 per cent. on the standard list. One large group some time ago placed orders for several hundred dozen files at the old discount, which is yet to come in. Canadian wire nails have risen during the last fortnight, as nails which were previously sold at 30s. are now 38s. 6d. per 100 lbs., and anything but plentiful at that. Stilson wrenches have gone up considerably, but merchants are shy in quoting, as evidently they are holding out for better prices. Several important inquiries have been made for the extra good quality of rim locks, which are not available, excepting perhaps in retail quantities; however, there are plenty of the cheaper class of locks, but buyers rather shun these as many architects have specified the better class, as undoubtedly many residences are being built in a superior style with more up-to-date fittings, because now wages are so high it practically costs the same to put on cheap material as compared with the better kind. In a similar manner many of the buyers specify imported hickory handles, whereas during the war they availed themselves of those locally made. During the week the S.A. Railways have been large buyers of British augurs, and altogether the demand was very well supplied. There were also some good indents placed on the Exchange from the Belgian Congo, and in a lesser degree Southern Rhodesia. Some of our mining groups are only buying from hand to mouth, whilst others are placing good indents for special lines with the idea that some goods show a tendency to advance both in Britain and America.

Timber and Roofing Iron.

The timber and roofing iron position is getting serious as regards the shortage of deals and roofing iron. As a considerable quantity of Baltic timber and roofing iron was lately received at the coast, it was only reasonable to expect that Johannesburg would have received fair quantities before now, but we have reckoned without our hosts who control things at the ports. It transpires that the demand is also extraordinarily good at the coast towns, and the rush there to secure stocks is so great that very little so far has been left over for Johannesburg. One hears of deals and iron being on the way, but one week passes and then another and it is usually admitted from a subsequent inquiry that they still have no definite news. At all events what happened on Thursday is that one firm's manager remarked that they had not two shillings' worth of iron or wood in their place. This figurative statement of speech is to illustrate the position as it actually stands. In consequence of this shortage prices have again advanced, as deals are 1s. 7½d. to 1s. 8½d.; flooring, 8½d. to 9d.; ceilings, 6¼d. to 6½d.; and galvanised roofing iron of 24 gauge, 1s. 5d. to 1s. 7d. per ft., according to length. Business is excellent, but a lot

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more could be done if stocks were available. The second-hand market is very poor indeed owing to the absence of fresh stocks. There are plenty of orders on hand for all kinds of suitable building timber as well as second-hand iron, both of which have advanced 1d. per ft. since last week, making deals 1s. 1d. to 1s. 3d., and any second-hand iron in good condition is readily snapped up at 1s. 2d. to 1s. 3d. per ft. The quandary in the second-hand yards is that they cannot see where any decent quantities of iron and timber are coming from.

ELECTRICAL GOODS.

Owing to the dearth of materials business in this market is rather slack; tubing is, if anything, even scarcer than before. In the opinion of a leading dealer this state of affairs is likely to continue for some considerable time, as it is impossible to procure the needed materials from Home, as manufacturers have simply not got them. Prices generally are firming up all round. Lamps are generally expected to increase in price at the end of the current month. Orders are plentiful, but owing to the absence of stocks, more especially tubing, these have in many instances to be returned as impossible of execution. Ceiling roses, lamp holders and switches are getting very scarce indeed. Until the end of the war these were procurable from Japan, but they are unobtainable now. About four or five months ago ceiling roses were selling at from 4s. 6d. to 5s. a dozen; now they can scarcely be got in town, except in retail quantities, and fetch 10s. 6d. a dozen. Lamp holders, which went down from 15s. to 10s. 6d., are now up again to 12s. Switches came down from 36s. to about 21s., and are now ruling at about 24s. Indeed the tendency of prices all round is to firm up. Business on the Commercial Exchange has been of a very limited character, but indicating that prices are better to-day than they were a month ago.

DYNAMITE.

No new information is available from the local dynamite company. Hopes had been entertained by them of a reduction in the price of raw materials, especially glycerine, but no news of importance has as yet been received. Obviously the present extensive stocks are being gradually absorbed, but the process is likely to continue still for some considerable time. In the meantime glycerine, which was so freely used during the war for munition purposes, must as a matter of course become more plentiful and therefore less costly.

OILS, COLOURS AND BRUSHWARE.

Painters' brushes, such as sash tools and oval ground brushes, are very scarce and dear, with little chance of any extensive replenishment. The values of paint ingredients are very unstable, therefore close prices are very difficult to obtain. Indian linseed oil, raw, 95s.; boiled, 100s.; Argentine, raw, 100s.; boiled, 105s.; British, 18s. per imp. gall.; turps, 105s. to 110s. 2-4's, and 115s. 10-1's; white lead, Canadian 80s., and British 90s. per 100 lbs.; imported grease, £40 per ton, and local made £28 to £33. The price of the local grease is up £1 per ton in consequence of all fats being so scarce and dearer through the drought. Olive oil, 35s. a gall; American best salad oil, 140s. to 145s.; South American, 125s.; African, 95s. to 100s. Business is excellent throughout the painting trade and there are no competent painters out of employment. There is an excellent demand for plate glass, and the good stocks of about three months ago are getting much lower in consequence of everyday absorption. It is feared that the outlook for the moment of obtaining new stocks from England is very indifferent.

IRON, STEEL AND MACHINERY.

Business has gone off a lot during this month and it is difficult to obtain any reasonable explanation for the present dulness. Perhaps the chief reason is that merchants are very diffident about ordering iron and steel from oversea, as there is great uncertainty about prices, which seem ever on the up-grade. This aspect of affairs has created a local demand from one merchant to another. The smaller sizes of imported bar iron have been pretty well absorbed as there are no large parcels available from the merchants, but the larger sizes are still somewhat of a drug in the market. This view is borne out by the fact that the Vereeniging price for mild steel for the big sizes has dropped from 35s. to 33s. 6d. per 100 lbs. As regards piping, in consequence of the drought the agriculturists have been much in evidence in securing second-hand piping up to 3 inches, thus steadying the prices considerably. For example, at an auction sale 1¼ inch black piping fetched 1s. per ft., which could have been had cheaper in some of the second-hand yards. Wheelbarrows have also been much in demand for farm purposes. Two weeks ago a wheelbarrow could be had for 40s., but now since the extra demand set in they are 47s. 6d. each. Shovels have also risen to 57s. 6d. and 65s. per dozen, according to sizes. Imported bar iron is 32s. 6d. to 35s. per 100 lbs. Steel plates, 35s. to 40s. per 100 lbs. There is a heavy demand for barbed wire for fencing purposes, large rolls, 42s. 6d. each; imported mild steel, 45s. per 100 lbs.; drill steel, 7½d.; and tool steel, 1s. 3d. per lb.; brass rods, 2s. 6d. per lb.

THE TREND OF THINGS.

A shopkeeper stated that the falling-off in the butter demand was on account of high prices, and the difficulty of obtaining it was likened to being cut off sharply with a knife. Naturally people have gone on to substitutes, therefore all fats have practically doubled in price as compared with pre-war times. This has had the effect of increasing soap at the wholesale factories by 20 per cent., and locally-made grease is up from £1 to £2 per ton. These matters are particularly mentioned to show that the prolonged drought has had a serious effect on trade and consequently the poorness of business at the moment is part and parcel of the penalty. The animals about the streets are showing

LECTURE
by
Mr. W. E. BLELOCH.

On
Far East Rand.

SHARE VALUES:
How to Know Them.

E.R.P.M. PROBLEM:
Central Rand Main Reef Series
S.E. of Boksburg.

SCREEN PICTURES.

SELBORNE HALL.

Chair: Mr. A. E. O'FLAHERTY, 8 p.m.

Wednesday, 29th October.

All Interested Invited.

the bad effects of the high cost of forage, as green barley is 10s. per 100 lbs.; cow meal, 18s. per 180 lbs.; local forage up to 11s. 9d. per 100 lbs.; lucerne, green 11s. 6d., and dry 12s. 6d. per 100 lbs.; and teff hay grass, 12s. 6d. per 100 lbs. Every day one hopes that this disastrous drought will come to an end, but it does not. Letters are already out from the Rand Water Board urging that every precaution be taken to restrict the use of water and that notices be issued to stop the watering of private gardens. Representations had also been made to the mines and railways, who had agreed to curtail their consumption forthwith. The letters conclude by saying that unless rains fell at an early date the water position would become extremely critical.

The Town Council are entering into competition with the ice-makers and will sell 212 lb. blocks of ice at 2s. each, delivered at the abattoirs. This feature of active competition is questionable, but as the scheme is that the Municipality should be in a position to offer cold storage facilities to anyone who comes along, that may be its saving grace from a public utilitarian point of view. So far co-operative societies have not been a success in South Africa, because of the Asiatic and other cosmopolitan trading communities, and certainly the time is not ripe for extensive Municipal trading, chiefly because of the cumbersome red tape and inter-department jealousies, to say nothing of the feuds and conflicting interests amongst the Town Councillors.

COMFORT FOR SOUTH AFRICAN MANUFACTURERS.

According to Reuter, the London *Times* says the fact that South Africa stands somewhere near the bottom of the list in respect to the increased cost of living as compared with pre-war days, has a favourable bearing on the prospect of manufacturing enterprises started in the Union under wartime conditions, also on the question of the establishment of branch factories in the Union by English firms. In this connection there are the dynamite factories, cement makers, biscuits, boots and shoes, soaps, candles, cheese, chemicals, disinfectants and lubricants, foundries and engineering shops, fencing, furniture, harness, caps, pipes and tiles, boats, tanneries, tinware, tobaccos and cigars. In fact, according to the list of South African manufacturers, there are no less than 240 headings from the principal manufacturers for separate things in the Union. The journal points out that some of the manufactories established during the war may be unable to survive in time of peace without a supply of raw materials. At present we have anything but commercial peace, whatever the official documents be as to the settlement of the actual fighting, therefore the raw material question is not at present of paramount importance, but that is quite a doubtful point, as we are only manufacturing on our own raw material as a general statement. The next paragraph, however, is a keener illustration. "Others will find adequate internal protection in the present high freights and the costliness of labour both in England and America and a moderate tariff." And again it says: "While a third class may even be able to develop a profitable export trade." The production of pig-iron in the Transvaal is included by the *Times* among the new industries which will repay watching, owing to the extensive demand in the Union and Central Africa for railway material and bridgework, as well as for agricultural machinery. All this is excellent, but add our wonderful coal industry in the Transvaal and Natal—what more inducements do hard-headed and hard-working men wish for to assist in developing our great commercial and industrial future.

MAGNOLIA
ANTIFRICTION METAL
"FLOWER" BRAND.

TRADE MARK

HAS THE LOWEST CO-EFFICIENT OF FRICTION.
KEEPS down the bill for lubricants, making **BEARINGS** smooth as glass and keeping them **COOL** under heaviest pressures and highest speeds.
Manufactured and Sold By—
**THE MAGNOLIA ANTI-FRICTION
METAL CO. OF GREAT BRITAIN, LIMITED,
49, QUEEN VICTORIA STREET, LONDON, E.C.**
Agents for South Africa: FRASER & CHALMERS, Ltd., Johannesburg, Bulawayo and Salisbury.

Cape Diggings Diamond Output.

Statement of the output of diamonds from the public diggings in the Cape Province during the month of September, 1919:—

BARKLY WEST.

Area.	No. of Diggers.	Weight. Carats.	Value.		
Delport's Hope	29	166¾	£2,484	0	0
Eland's Drift	3	23¼	281	0	0
Forlorn Hope	1	¾	11	0	0
Gong Gong	35	239½	3,469	0	0
Good Hope	79	317	3,676	13	0
Harrisdale	26	168¼	2,845	15	0
Hebron	74	306¼	5,615	5	0
Holpan	16	63¾	996	10	0
Jonas Kopje	2	7¼	72	0	0
Kareepan	64	366½	6,486	15	0
Keiskama	8	28¼	294	10	0
Klipdam	68	359½	5,332	11	0
Klipdrift	38	137¼	1,773	5	0
Last Hope	4	25¼	250	10	0
Longlands	26	255¾	7,790	0	0
Niekerk's Rush	4	14¾	176	10	0
Rickett's Prospect	6	33¼	648	7	6
Scholtz's Prospect	23	85¼	1,839	0	0
Snyder's Rush	9	58	1,093	10	0
Van Zoelen's Laagte	7	22	262	10	0
Waldeck's Plant	42	317½	7,038	15	0
Ward's Hope	5	17	223	5	0
Winter's Rush	39	387¼	8,870	17	6
	608	3,400¼	£61,531	9	0

N.B.—The number of claimholders in the Barkly West district during September, 1919, was 1,991.

HERBERT.

Brypaal	12	50¾	730	10	0
Davisdrift	3	32½	613	10	0
Mosesberg	225	1,419½	25,682	5	0
Schmidt's Drift	47	225½	3,953	2	6
Sevonelles	1	1¾	15	0	0
	228	1,730	30,994	7	6

KIMBERLEY.

Robinson's Kopje	4	23¼	696	2	6
Wedberg	4	13½	325	10	0
	8	36¾	1,021	12	6

TAUNGS.

Home Rule	101	1,881¾	32,244	5	0
Killarney	3	30	900	10	0
	104	1,911¾	33,144	15	0

PRIVATE ESTATES.

River View Diamond Syndicate	183¼	3,271	10	0
New Vaal River D. & E. Syndicate	755	13,937	5	0
Pniel Estate	218¾	4,619	0	0

Latest Company Registrations.

Pretoria Marble Co., Ltd., Alexandra Buildings, Pretoria; capital, £10,000.

Allen, Wack and Shepherd, Ltd. Barsdorf Buildings, Ground Floor, Marshall Square; capital, £675,000.

The Waterberg Transport Company, Limited, 222, St. Andries Street, Pretoria; capital, £5,000.

T'Sama Gold Mines, Ltd., 97a, Commissioner Street, Johannesburg; capital, £45,000.

R. G. McKowen and Radford, Ltd., 115, Main Street, Johannesburg; capital, £10,000.

The Rhodesian Timber Syndicate, Limited. 119 and 120, Stock Exchange Buildings, Fox Street, Johannesburg; capital, £500.

Barimar (South Africa), Limited, First Floor, Barsdorf's Buildings; capital, £5,200.

Diamond Deeps, Ltd., 55, Princes Street, Troyeville, Johannesburg; capital, £3,500.

Transvaal General Engineering, Ltd., 73, Jeppe Street, Newtown, Johannesburg; capital, £1,000.

Colliery Trading Stores, Ltd., 49 and 50, Permanent Buildings, Harrison Street, Johannesburg; capital, £1,000.

Phœnix Foundry, Limited. 83, Hay Street, Ophirton, Johannesburg; capital, £10,000.

The Kleinkramer Company, Limited, 5, 6, 7, and 8, Royal Chambers, corner Fox and Simmonds Streets, Johannesburg; capital, £2,000.

S. Fisher and Simmons (East Africa), Limited, 110, Marshall Street, Johannesburg; capital, £15,000.

J. and R. Niven, Limited, Barsdorf's Buildings, Marshall Street, Johannesburg; capital, £20,000.

Victory Diamonds, Ltd., c/o M. Edmund, c/o L. Charlston, Goch and Co., Exploration Buildings, Johannesburg; capital, £60,000.

Bembesi Mines, Ltd., 148/151, Exploration Buildings, Johannesburg; capital, £100.

The Reinforcing Steel Co., Ltd., Central House, Main Street, Johannesburg; capital, £10,000.

The Geldenhuis Small Holders' Association, Ltd., The Assembly Hall, Geldenhuis Estate, Johannesurg; capital £800.

City Brass and Iron Foundry, Ltd., 236, Main Street, Johannesburg; capital, £3,000.

Hedall Gorge Gold Mining Co., Ltd., 90/94, Exploration Buildings, Commissioner Street, Johannesburg; capital £1,000.

Hector Lezard, Ltd., Strathearn House, corner Rissik and Fox Streets, Johannesburg; capital, £1,000.

Joffe, Ltd., 137, Bree Street, Johannesburg; capital, £2,300

Murray Bros., Ltd., 94, President Street, Johannesburg; capital, £3,000.

The Schoongezicht Collieries (Witbank), Ltd., Lewis and Marks' Buildings, 65, President Street, Johannesburg; capital £75,000.

De Spectator, Beperkt, 157, Durban House, Church Street, Pretoria; capital £2,500.

Producers, Ltd., 3 and 4, Norwich Union Buildings, Fox Street, Johannesburg; capital, £1,500.

Herbert C. Gain, Ltd., 13, Siemert Road, Doornfontein, Johannesburg; capital, £55,000.

The Governor-General's Fund Properties, 104, Stock Exchange Buildings, Johannesburg; capital, £1.

Modder Brickyards, Ltd., 58, Cranbourne Avenue, Benoni; capital, £500.

Lion Bacon Co., Ltd., 3 and 4, Norwich Union Buildings, Fox Street, Johannesburg; capital, £3,000.

Picot and Moss, Ltd., Hatfield House, corner Eloff and President Streets, Johannesburg; capital, £1,000.

Southern Printers, Ltd., 55, Commissioner Street, Johannesburg; capital, £1,000.

Brakpan Produce and Live Stock Agency, Ltd., 9, South African Mutual Buildings, Harrison Street, Johannesburg; capital, £2,000.

Transvaal Wholesale Co., Ltd., 30, Von Weilligh Street, Johannesburg; capital, £25,000.

Picot and Co. (O.F.S.), Ltd., Hatfield House, Eloff Street, Johannesburg; capital, £1,000.

Upper White River Estates, Ltd., 58, National Bank Buildings, 5th Floor, Simmonds Street, Johannesburg; capital, £20,000.

L. U. Partridge, Ltd., 50/52, Cullinan Buildings, Johannesburg; capital, £7,500.

Rustplaats Coal and Chemical Co., Ltd., 6th Floor, Consolidated Buildings, Fox Street, Johannesburg; capital, £20,000.

The Albion Collieries, Ltd., Klerk Street, Ermelo; capital, £2,000.

Eureka Gate and Fence Co., Ltd., 171, Fox Street, Johannesburg; capital, £2,000.

British Reinforced Concrete Sleeper Co., Ltd., 98, Stock Exchange Buildings, Marshall Square, Johannesburg; capital, £500.

Die Westelik Transvaalse Eksekuteurskamer and Voogdij Maatskappij, Beperkt, Schweizer Reneke Straat, Schweizer Reneke; capital, £15,000.

Roodepoort Land Co., Ltd., Smuts Street, Greylingstad; capital, £1,008.

FOREIGN COMPANIES.

Rouxville Diamonds, Ltd., care F. H. Down, Consolidated Gold Fields Buildings, Simmonds Street, Johannesburg; capital, £200,000.

Angra Pequena Diamonds, Ltd., c/o T. E. Duckles, 17-18, Standard Bank Buildings, Commissioner Street, Johannesburg; capital, £50,000.

ALTERATIONS AND ADDITIONS TO FOREIGN COMPANIES.

Hepworths, Ltd., Johannesburg.
Nederlandsch Zuidafrikaansche Hypotheekbank, Johannesburg.

CHANGE OF NAME.

The Colonial Banking and Trust Company of Africa, Ltd., Johannesburg, to The Colonial Banking and Trust Company.

PROSPECTUSES.

African Screenart Corporation, Ltd., Johannesburg. (2)

NOTICES OF INCREASE AND DECREASE OF CAPITAL.

Vereeniging Milling Company, Ltd., Springs; increased from £30,000 to £50,000.

Co-operative Furnishers. Ltd., Pretoria; increased from £1,000 to £10,000.

Continuous Centrifugal Separators, Ltd., Johannesburg; increased from £15,000 to £25,000.

Heydenreich Bros., Ltd., Johannesburg; increased from £1,000 to £10,000.

Grootpan Collieries, Ltd., Johannesburg; increased from £12,000 to £15,000.

Economical Coal and Produce Company, Ltd,, Johannesburg; increased from £1,000 to £2,000.

Grootvlei Proprietary Mines, Ltd., Johannesburg; increased from £400,000 to £650,000.

The Alkali Exploration Syndicate, Johannesburg; increased from £2,500 to £4,000.

COMPANIES IN LIQUIDATION.

Davis & Hughes, Ltd., Johannesburg; capital £600.
Macaulay, Ltd., Johannesburg; capital £2,000.
Frieda Pietersburg Gold and Developing Company, Ltd.; capital £10,000.
Northern Houses, Ltd., Johannesburg; capital £100.
Moynihan, Ltd., Johannesburg; capital £60,000.
Industrial Development Company, Ltd., Johannesburg; capital £100,000.
Nolan Lime Works, Ltd., Johannesburg; capital £40,000.
Atlas Iron and Brass Foundry, Ltd., Johannesburg; capital £300.
South African Asbestos Company, Ltd., Johannesburg; capital £5,000.

To Sell Mechanical Progress.

It is the opinion of many acute business men that commercial method and proficiency must be raised to a higher plane to balance the recent extraordinary advance in British technical knowledge and skill, especially in the departments of engineering and chemicals. For the time being applied science as exemplified by inventions and improvements affecting transport by land, sea and air, higher efficiency in the factory and the farm and public and private social convenience had gone ahead of the commercial system which ought to open markets for these inestimable advantages. The world is to some extent waiting for an equivalent effort of higher salesmanship. It is partly to meet such new conditions that a scheme involving an expenditure of about half a million sterling is being organised by London University for complete commercial training in all the operations of commerce. It is intended that students shall have the opportunity of taking a degree in due course, and while on the one hand generous donations to the fund are being made by leading business houses, their directors have also intimated that they will be ready to take students on their staff at good salaries as soon as they are qualified.

PREMIER (Transvaal) DIAMOND MINING COMPANY, LIMITED.

(Incorporated in the Transvaal.)

DIVIDEND No. 30 PREFERENCE SHARES.

NOTICE IS HEREBY GIVEN that the Thirteenth Dividend on Preference Shares of 125 per cent, or 6s. 3d. (Six shillings and threepence) per share (less the Union of South Africa 7½ per cent. Dividend Tax), for the half-year ended 31st October, 1919, will be payable to all shareholders registered at the close of business on that date.

WARRANTS in payment of the Dividend will be issued to South African Shareholders from the Head Office, Johannesburg, as soon as the necessary returns have been received from the London Office, but owing to the irregularity of the mail service there may be some delay.

COUPON No. 30 in respect of the Dividend on Bearer Warrants can be presented for payment at the Head Office, Johannesburg, on and after the 25th October, 1919, and must be left five clear days for examination.

By Order of the Board,
T. EDINGTON,
Secretary.

Head Office:
Cullinan Buildings,
Simmonds Street,
Johannesburg.
20th October, 1919.

THE

S.A. Mining
AND
Engineering Journal

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NOTICE.—The postage of this issue of the *S.A. Mining and Engineering Journal* is: South Africa, 1d. All other parts, 1½d.

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Notes and News

The Cinderella to Restart?

Rumours that the Cinderella was about to restart are doubtless due to the fact, mentioned by Mr. W. E. Bleloch on Wednesday night, that Sir George Albu had decided to examine further the reefs out-cropping on that property.

* * * *

Spencer Bay Diamonds.

It should be made clear that the report on the prospects of the Spencer Bay Diamonds, printed in our last issue, was supplied to us by the promoters of the syndicate. As a result of certain queries addressed to us, further information is being sought regarding the flotation.

* * * *

The Sub Nigel Affair.

The papers have been full during the week of the discussion between Mr. J. Andrew Cohen and the local managers of the Consolidated Goldfields in regard to the policy of the representatives of the latter company on the Sub Nigel board. Through the vote of the Goldfields control Mr. Cohen was replaced at the annual meeting by Mr. J. M. Fisher on the board; and he has retaliated by attacking the Goldfields for their past management of the Sub Nigel. The controversy appears to be still proceeding.

* * * *

Industrial Advisory Board.

A meeting was held the other day of the Advisory Board of Science and Industry, but in the absence of Mr. Warington Smyth no statement has been issued regarding the decisions reached. In terms of its appointment, we believe, the Board has only some six months to exist in its present form, and at the end of that period it will require a new mandate. It would seem to us that a shorter and better title, and one more expressive of its activities would be "Industrial Resources Board," and it is to be hoped that any changes that may be made in the constitution of the Board will include this alteration of title.

* * * *

Crown Mines Improved Position.

The report of the directors of the Crown Mines for the quarter ending 30th September, 1919, shows that the total footage was 8,924 feet and the total footage sampled on reef 4,370 feet. The payable reef disclosures were as follows:—Main Reef Leader: Feet, 2,830; width, 22 inches; assay value, 20·5 dwts. South Reef: Feet, 940; width, 30 inches; assay value, 15·3 dwts. There was a further substantial improvement in the results from the quarter's mining operations, the tonnage milled being 41,000 tons greater. Although the yield was 5d. per ton lower, working costs were reduced 1s. 8d. per ton, with a consequent increase in profit of 1s. 3d. per ton milled. The combined result of these factors was an increase in working profit of £42,689. Development operations were maintained with satisfactory reef disclosures. Apart from the development figures recorded above, No. 15 shaft was sunk 691 feet to a depth of 2,704 feet, and No. 5a shaft 297 feet, to a depth of 713 feet. The native labour force at the end of the quarter was 13,298, as compared with 13,072 at the end of June, 1919. The first assessment has been received under the Miners' Phthisis Act, 1919, for the quarter commencing 1st August, 1919, under which largely increased compensation is payable. The profit for the quarter has been arrived at after charging working costs with the increased assessment for the last two months of the quarter, namely, £6,592. Facilities for a free market in gold have now been obtained, and the results stated above do not include the increased price now being received on the gold shipped since the 25th July last. The gold so far sold, which is equal to a little over one month's output of the Witwatersrand, has realised a premium of approximately 16 per cent. Any increased profits obtained by the company will be published quarterly after receipt of the account sales, but it is impossible to say how long the increased price for gold will be obtained.

Mr. C. D. Leslie Retires.

Mr. C. D. Leslie has retired from the position of Consulting Engineer to the Consolidated Gold Fields of South Africa, and has decided, we understand, to take up farming. Mr. Leslie has had a long and successful connection with the Rand, and has occupied many responsible positions with the Gold Fields Group. He was given a farewell a few days ago by his brother consulting engineers, and the speeches made during the evening all testified to the high esteem in which he was held in the mining industry. We wish Mr. Leslie every success in his new career.

* * * *

Sir Lionel Phillips Interviewed.

Sir Lionel Phillips was interviewed at Paris last week. He says that he is optimistic as regards the future, owing to the premium on gold, which will now enable the low-grade mines to make a profit, and enhance the profits of others, and permit the latter to crush ore in keeping with the average grade of their reserves. In his opinion the rates of exchange should ensure the maintenance of the gold premium for a considerable time, and, furthermore, labour difficulties would be solved when phthisis was overcome by the methodical use of Lister's serum, which would improve the condition of the mines to an extraordinary degree. He also stated that in his opinion the extreme richness of the Far East Rand would be fully demonstrated when the Modderfontein East began producing in about eighteen months' time. Sir Lionel is sailing for South Africa about October 30.

* * * *

South African Carbide and By-Products.

An interesting proposition, floated in London in mail week, is the South African Carbide and By-Products Company, which has been formed with a capital of £307,500, divided into £300,000 seven per cent. cumulative participating preference shares of £1 each and 150,000 ordinary shares of 1s. each. It is the preference shares that are offered to the public, and these are entitled, after receiving a 7 per cent. dividend (free of income tax up to 6s. in the £), to participate in any surplus profits until they have received a further 7 per cent. (less tax). The company is promoted by the Chemico Electric Company for the purpose of manufacturing calcium carbide and of extracting motor spirit, tar oil, and other by-products from coal and shale at Ballengeich Collieries, Natal, South Africa. The colliery is situated on the line between Johannesburg and Durban, and the works will be built on an adjoining site, while a contract has been entered into providing for a supply at 2s. per ton of 1,000 tons per week of "fines," small coal, and "pickings." In a proposition of this sort estimates of profits are apt to be misleading, but the technical reports are favourable, and there is little doubt that the company would find a ready market for its products at good prices. The cost of the plant, including cost of erection and an allowance for contingencies, is estimated at £252,500, leaving £23,000 for working capital. The whole of the preference issue has been underwritten by the Chemico Electric Company for a commission of 5 per cent., and they also receive £17,000 in cash, in consideration of paying all other preliminary expenses, and also the right to subscribe for the ordinary shares at par.

* * * *

Mine Directors Receive Unique Memorial.

At the meeting of the board of directors of the Geldenhuis Deep, Limited, held on Tuesday, in Johannesburg, the Chairman announced that he had received from the employees of the mine who had returned from military service a gratifying acknowledgment of the appreciation felt by them regarding their treatment by the Board. This acknowledgment took the form of a memorial to the Board, in the following terms: "We, the undersigned employees of the Geldenhuis Deep, Limited, on our return from active service, would like to place on record our appreciation of the generous manner in which we have been treated by the company. It was an enormous boon, especially during the periods of danger, to feel free from financial troubles, and to know that our dependents were living in comfort." The memorial contains seventy signatures, representative of all ranks, and the manager states that very many more had since told him that they would have been glad to sign had they had the opportunity. The Chairman remarked, incidentally, that out of a mine complement of about 500, no fewer than 204 had performed military service, and of this number 18 had laid down their lives. He further announced that on behalf of the Board he had sent a reply to the manager, expressing the gratification with which he and his co-directors had received this unsolicited tribute. The Board ordered the memorial to be framed, and hung in the board-room.

* * * *

Tin and Tungsten Research Board.

The Tin and Tungsten Research Board which was established last year has now issued its first annual report. The contributions from local mineowners and landlords amounted to £2,753, and the expenditure on research and incidental expenses to £2,512, half of which has been met by the Committee of Council, leaving a balance in hand (including interest from invested funds and from the sum transferred by the Institution of Mining and Metallurgy) of £2,001, which will be carried forward to next year's account. The work of the Board has been hampered by the shortage of materials and research workers, but six papers have been read before the Institution of Mining and Metallurgy in which the results of some of the investigations have been described; while Professor Truscott, assisted by Messrs. J. H. Goodchild, K. S. Low, and Burnie, has completed his research into slime treatment on Cornish frames, and his conclusions have been published in Bulletin No. 175 of the Institution. As a result of the whole series of tests, modifications of two fundamental factors in policy have suggested themselves, one being in favour of rapid enrichment, in place of the present practice of gradual enrichment, the other being in favour of extending the practice of fine grinding and sand residues. Professor Truscott claims that by a systematic adoption of these two practices an increase of 11 per cent. of the present recovery of tin would be gained. A number of other investigations carried out for the Board are described in the notes by Sir Thomas Kirke Rose, the chairman of the Research Committee, which are appended to the Board's report. It is anticipated that more rapid progress will be possible during the current year, as arrangements have been made to attack systematically the chemico-physical problems which underlie the extraction of metals from their ores with special regard to the recovery of tin and tungsten. The governing bodies of the Imperial College of Science and Technology and of the School of Metalliferous Mining (Cornwall) have continued to afford laboratory facilities, and various Cornish mineowners have supplied ores free of charge and made arrangements for carrying out tests on their dressing floors.

* * * *

Mine Workmen's Committees.

In the course of a very interesting statement before the Low Grade Mines Commission in Johannesburg last week, Mr. G. Hildick-Smith, manager of the Robinson Gold Mine, urged the necessity of pulling together as between management and men on the mines. "The best results for all concerned on any mine," he said, "can only be obtained through proper 'team work,' in the same way exactly as the best results can only be obtained by a football team. It is not by having a few 'star' men that either a mine or football team does best; but rather by the combined efforts of all members of the team, which combined efforts, so far as our mines are concerned, can be much improved through the medium of meetings of the managements and workmen's committees, when all employes—both those on the staffs and in the ranks—will gradually become better educated up to the right spirit of co-operation by means of regular meetings with each other. In order to obtain the best results, much tact and patience are required, as lessons in co-operation are often learnt by both managements and men's sides only slowly.'' The witness gave many interesting views on the working of such committees, particularly pointing out the difficulty in the first few meetings of getting the men to realise that an endeavour was being made to settle their grievances and obtain their cooperation. If that could be accomplished, numerous points for settlement were brought forward, fewer being raised at each successive meeting. Witness advised the Commission to consider the advisability of recommending the adoption of some such standard organisation as the following:—(1) That on every mine there should be a general workmen's committee, composed of the present underground so-called Grievance Committees and the Surface Shops' Committees. (2) That the General Workmen's Committee should meet the management once a month. One point should be emphasized, and that is that it is absolutely essential that by management is meant not only the manager, but also all the heads of the various departments of the mine. (3) That at such meetings minutes should be taken, copies of which should be sent to the Chamber of Mines and the headquarters of the various workers' unions. (4) That the mines of the Reef should be divided up into districts, and for each district there should be elected a District Committee, formed of two representatives of the management for each mine in the district, with one independent representative appointed by the Chamber of Mines, and an independent representative appointed by the workers' unions, such committees to hold regular monthly meetings. (5) That Reference Boards, as at present constituted, should be the final Court of Appeal, when any matter cannot be settled at the mine or district meetings.

* * * *

Rooiberg Minerals' Policy.

Colonel W. Dalrymple, speaking at the annual meeting of the Rooiberg Minerals Development Company, Ltd., held this week, stated that the amount derived from the sale of tin during the year was £53,961, and £726 from interest and sundry revenue, while the working expenditure was £70,178, which included all expenditure upon development, exploration, and alluvial sluicing, totalling £22,552. The grade of ore milled was 1.60 per cent., as compared with 1.89 per cent. for the previous year, and the extraction was 75.14 per cent., which was somewhat lower than that of the previous four years, which averaged 79.5 per cent. In view of the fact, he said, that the company possessed no ore reserves capable of estimation, and as there were no large bodies of ore from which to draw a sufficient tonnage to keep the mill running at full capacity, in order to economise as much as possible, it was decided to close the mill in May, 1919, and to stack all the ore won for treatment at a later date. Since that time stock slime and sand only had been treated. A vigorous policy of exploration and development was continued, and at the end of the year 2,350 short tons of ore were available for treatment. In this connection it must be remembered that whilst the cost of mining and accumulating this ore was met during the year no credit for the value thereof had been taken into the accounts. At Sept. 30, 1919, the tonnage of ore stacked had increased to 7,816 short tons, the approximate metallic tin contents being estimated at 2 per cent. per ton. "The summary of the position is," he continued, "that we continue to find over the area at distances apart, many enrichments, but of insignificant size and ore contents, and the indications are such that this will continue. Hence we have, in the best interests of shareholders, to continue systematising our exploration, in the hope of exposing ore bodies with supplementary fillings on the same line as in the earlier days of the ventures, so long as the revenue from the tin produced and our reserve fund is sufficient to meet the expenditure." Of the 150 men employed by the company at one time or another during the war, 13 proceeded on active service, and the total amount paid by the company since the beginning of the war in respect of active service allowances reached £3,435, and the employes themselves had contributed £2,610 to the various war funds. The reports and accounts were adopted.

TOPICS OF THE WEEK.

SOME NOTABLE SPEECHES.

The annual dinner of the South African Institute of Electrical Engineers, held last Saturday night, evoked some notable pronouncements. The Minister of Railways had much of interest to say regarding the cost of living, the question of unemployment of returned soldiers, and railway electrification. His Excellency the Governor-General gave some sound advice on the need for give-and-take between employers and employed, which is very opportune, in view of the forthcoming conference. General Byron recounted some of the outstanding lessons of the war, and the President (Mr. A. E. du Pasquier) excelled himself in a speech as witty as it was appropriate to the occasion. Mr. Cazalet was able to make the important announcement that his cherished scheme for the linking up of the scientific societies is now on the point of fruition, and it was entirely fitting that the electrical engineers' annual reunion should have provided the opportunity for publishing that welcome news. To the Minister of Railways, however, the chief honours of the evening easily fell, and his speech was full of facts of the first importance. He showed that the South African Railways had more than fulfilled their promises to their returned men, and that from Sir William Hoy downwards everyone was helping to find work for more men.

On the increased cost of living, Mr. Burton said he was still trying to get a suitable Commission appointed. As soon as that was done the Government would reconstitute the local committees in the various towns. Profiteering, he said, was clearly not a disease, but a symptom of a disease, or an exaggeration of a disease. Mr. Hoover, the American expert, had emphatically declared that the idea of reducing the cost of living by fixing prices was a chimera, and could not possibly have any beneficial effect. What Mr. Hoover observed in his remarkable memorandum on the economic situation in Europe was:—"No economic policy will bring food to those stomachs or fuel to those hearths that does not secure the maximum production. There is no use of tears over rising prices; they are to a great degree a visualisation of insufficient production." It is the conviction of those whose business it has been in Great Britain, Australia, the United States, and elsewhere, to examine critically the whole facts of the world-wide increase in the cost of living that, although profiteering may be a factor which ought to be eradicated, it is in the sum total an infinitesimally small factor when compared with the main causes of high prices, the most notable of which is under-production.

On the question of railway construction, Mr. Burton pointed out that we in South Africa were six years over-due with new railway construction. The time had come when we had to face the urgent necessity of embarking upon a scheme of new railway construction. Regarding the electrification of the railways, Mr. Burton mentioned the opinion of the expert, Mr. Merz, who had stated that he knew of hardly any country which was so favourably situated for the electrification of its railways as South Africa. It was the intention of the Government to carry out the recommendations made by Mr. Merz at the earliest possible opportunity—and he trusted that one of the results would be—perhaps it would be only one of the minor results—that there would not be so many complaints about shortage of trucks between here and Durban. "There can be no doubt whatever," Mr. Burton declared, "that if the report is carried into effect the change which will be made in our railway system will be almost revolutionary. It will have a tremendous effect; it will in some cases double our carrying power; it will have the most beneficial effect upon the whole country. We shall go ahead with that as soon as we possibly can; that we undertake to do."

This, of course, is excellent news, not only for the business and engineering world, but for our local trade as well. The Witbank section of the line, which taps the coalfields for the gold mines, will, we understand, be one of the first to be electrified. The South African Institute of Electrical Engineers, need we add, is to be heartily congratulated on evoking this most momentous announcement from the Government.

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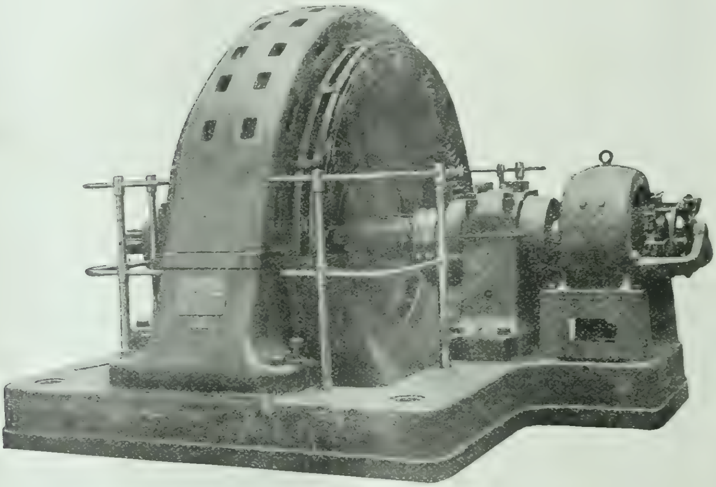

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THE MINE WORKERS' LATEST LIST OF DEMANDS.

Flat Rate Increase of £2 8s. per Week !—Forty-four Hour Week—Works Committees—Mines, V.F.P. and Rand Water Board Affected.

The Chamber of Mines, the V.F.P., and the Rand Water Board have received the following list of demands from the South African Industrial Federation on behalf of the Mine Workers' Union and affiliated bodies. We print the list without comment, as we understand it will be discussed at an early date by the parties concerned. It is little over a year since the Chamber and the Federation came to an agreement regarding the last list of demands, and the present list is doubtless put forward in view of the forthcoming conference of employers and employed at Pretoria.

Demands.

(1) That a flat rate increase be demanded of £2 8s. per week on present rates exclusive of war bonus.

(2) That we demand a forty-hour week for all men working underground and a forty-four hour week for surface workers.

(3) All agreements to be based on a 24 hours' notice on either side.

(4) That where possible all overtime to be abolished, and where overtime is necessary and worked it be paid for at the rate of time and one-half till midnight and double time thereafter till the usual starting time next day. Public holidays and Sundays to be paid for at double rates and any employee called out on Sunday for any period to be paid not less than one full shift. That all hours worked between the usual stopping time at night and the usual starting time next day to be considered overtime. Men on recognised night shift to be paid at the rate of time and one-quarter, overtime rates to be applicable to all workers in the industry.

(5) That all men employed as truck-repairers be paid a minimum of 80 per cent. of boilermakers' wages and participate in the overtime arrangement.

(6) That all tools for underground work to be supplied by the mining company, also oilskins and gum boots when and where necessary, for both underground and surface workers.

(7) That the 1st May be recognised as an annual holiday.

(8) That any arrangements of conditions be made retrospective from the date on which the demands go into the Chamber of Mines.

(9) That the schedule of wages for apprentices as agreed to by the Conference called by the Juvenile Advisory Board be put forward to the Chamber of Mines on behalf of apprentices.

(10) That facilities should be given to Works Committees to have their meetings not later than 2.30 p.m. once per fortnight without loss of pay.

(11) That painters employed on the mines should be placed on the same basis in regard to conditions, wages, etc., as all other artisans and mechanics.

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PERSONAL.

Mr. A. E. Simmonds, of Messrs. Bellis & Morcom, Ltd., Birmingham, is on a visit to the Rand.

* * * *

Mr. C. H. Williams has left the Griffin Engineering Co., and has started business on his own account.

* * * *

Mr. E. R. Schoch has resigned from the position of Consulting Engineer to the Rooiberg Company.

* * * *

Mr. B. Sankey, M.I.E.E., Electrical Engineer to the Municipality of Port Elizabeth, has been appointed to the post of Electrical Engineer to the Johannesburg Municipality.

* * * *

Messrs. Rice, Wilson & Herd have taken up the South African agency of the British-Thomson-Houston Co., Ltd., of Rugby, for all save some of the heavier lines made by that well-known firm.

* * * *

The many friends of Mr. A. L. Neale will learn with deep regret of his death, which took place in Capetown last Saturday. Prior to his retirement in 1910 Mr. Neale was General Manager of the Transvaal G.M. Estates, Ltd., and resident in Pilgrims Rest for about eight years. In Sabie he was equally well known and popular, having managed the Glynn's Lydenburg, Ltd., before going to Pilgrims Rest.

Mining Statistics for September.

The statistics for September issued by the Mines Department include the following figures concerning the mineral output for the past month:—Gold: Witwatersrand, £2,892,011; other districts, £79,600; total, £2,971,611. Silver, £17,782; diamonds, £1,072,228; coal, £316,131; tin, £26,575; other minerals, £8,819; total, £4,413,146. The labour figures for September are as follows:—

	Whites.	Coloured.	Total.
Gold mining ...	24,145	180,389	204,534
Diamond mining ...	4,335	23,211	27,546
Diamond alluvial, estate and river digging ...	5,322	16,203	21,525
Coal mining ...	1,723	31,904	33,627
Copper mining ...	207	1,982	2,189
Tin mining ...	226	2,690	2,916
Other base mineral mining ..	99	2,236	2,335
Grand totals ..	36,057	258,615	294,672

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THE GOLD AND EXCHANGE CONFERENCE.

Details of Resolutions Passed and Rejected—Free Gold Market and Uniform Banking Laws.

We are officially informed that a conference sat on October 22 and 23 to advise the Government upon the following matters: (1) The feasibility and desirability of establishing natural exchange rates between the Union and the rest of the world, and the probable effect upon Union industry, commerce and the cost of living; (2) the possibility of establishing a free market for gold in the Union, the practical steps necessary to that end, and the measures which may be necessary to prevent the drainage of gold coin from the Union under the existing conditions. The following gentlemen attended: The Minister of Finance (chairman), Mr. J. W. Jagger, M.L.A., Mr. C. T. M. Wilcocks, M.L.A., Lieut.-Col. F. H. P. Creswell, M.L.A., Sir Robert Kotzé, Professor R. Leslie, Messrs. A. French, N. Jennings, H. C. Jorissen, J. R. Leisk, E. Oppenheimer, E. C. Reynolds, J. S. Shiel, and J. G. van der Horst. Sir E. Wallers and Mr. Hector Mackenzie were prevented from attending, and were represented by Messrs. Leisk and Jennings. After discussion the following resolutions were submitted and rejected:—

Proposed by Mr. Reynolds: "That in the opinion of the conference, as the withdrawal of the prohibition of the export of gold coin will tend to drain the Union of such gold coin in a very short period, and that as it is impossible to replace the same unless at an excessive price, it is in the interest of the Union that prohibition remain until conditions become normal."

Proposed by Mr. Leisk: "That the establishment of natural exchange rates between the Union and the rest of the world is not feasible or desirable at the present time and until the facilities mentioned in paragraph (2) have been provided for; (a) such conditions imply a local free market in gold, which cannot be introduced until a refinery and mint have been erected in the Union; (b) in the absence of local refining and minting facilities the cost of exchange under natural conditions would be raised to a very material extent against the Union producer, and in this way would interfere with the development of the Union industries to the extent that would not be compensated for by a reduction in the cost of living. (2) That with the object of paving the way for a local free market, the Government and the gold mining industry take all possible steps to hasten the erection of the mint and refinery."

NATURAL EXCHANGE RATES.

Proposed by Mr. Jagger: "That in the opinion of the conference, it is highly desirable that the prohibition of the export of gold specie should be withdrawn as early as possible with a view to establishing natural exchange rates between the Union and the rest of the world, and re-establishing the Union currency on a gold basis."

Proposed by Mr. Jagger: "That in the opinion of the conference, it is highly desirable in the interests of South Africa that an agreement between South African gold producers and the Bank of England in regard to the sale of gold should be terminated at the earliest possible date, and that the provision of a South African mint as sanctioned by Parliament should be pushed on with the utmost dispatch."

The following resolutions were adopted:—

Proposed by Mr. Oppenheimer: "(a) That the establishment of natural exchanges and of a free market for gold in the Union is resirable; (b) that to this end the establishment of a mint and refinery should proceed with the utmost dispatch; (c) that the gold producers be requested to take steps to secure a modification of their selling agreement with the Bank of England so as to permit of its termination at short notice; (d) that an embargo on the export of specie from the Union be not continued after the establishment of a mint."

Proposed by Mr. Jagger: "During the course of their investigations the conference have been impressed with the necessity for one uniform Bank Act for the whole Union, and would impress upon the Government the urgency of the introduction of such a measure in the next session of Parliament, which should provide, *inter alia*, stringent provisions against the inflation of the currency."

To the latter Col. Creswell moved as an amendment to add the words, "and the establishment of a State banking institution." The amendment was rejected. The Minister of Finance refrained from voting on the resolution put.

The Engineers' Directory.

Excellent progress is being made with the preparation of the S.A. Engineer's, Electrical and Allied Trades' Directory, which is now in the press. To ensure the utmost accuracy and completeness a vast amount of work has been entailed, and the book in its final form will be a complete directory of the firms engaged in the engineering, electrical and allied trades, *plus* a list of the personnel of the mines, railways and municipalities throughout the Union and Rhodesia. Firms who have not yet returned the forms sent to them are earnestly requested to do so without delay. In some cases firms have sent in the lists of their specialities for the Buyer's Guide Section without signing them, and it would much simplify the work of compilation if firms conscious of having made this omission will communicate the fact to the Publishers, care of this journal.

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MORE LIGHT ON THE GOLD QUESTION.

Evidence from India and Australia—The Gold Producers' Association.

THE following extract from *The Economist*, dated 30th August, 1919, throws further instructive light on the gold question: "Gold to the value of $2,249,000 has been shipped or engaged for shipment from the U.S.A. Of this $1,550,000 is for China and Japan, $550,000 for South America, $67,000 for Switzerland, $62,000 for London, and $20,000 for Canada. The news received from Calcutta on the 26th instant that the Indian Government proposes to sell by tender fortnightly, commencing September 3rd, a minimum quantity of 325,000 tolas of gold (121,875 ounces) up to a total of £3,000,000 in three months, with a limit of Rs. 23.14.4 per tola (the equivalent of 15 rupees to the sovereign—that is to say, the ratio at which these coins are legal tender), coincides with the suggestion in our Bullion Letter of July 31st last. In view of the rates fixed for the sale of rupees against gold in Canada, and the price at which the currency gold reserves are to be offered for sale, there will be a handsome profit to the Indian Government, since the current price of gold in the Bazaars is about 30 rupees per tola. Whether this innovation will lead to a cancellation of notes to the extent of the profit, or to an increase in the silver reserves, or to an increment of the gold standard reserve, will depend upon how the Indian Government decides to handle the situation. In the opinion of those qualified to judge, these gold operations will tend distinctly to reduce the anxieties of the Indian Government with regard to silver, at any rate for the present."

NOTE.—One tola equals 180 grains, or three-eighths of a troy ounce. Hence with the rupee at 2s., 30 rupees per tola of fine gold equals £8 per ounce.

In regard to the price of gold, the following is an extract from *Industrial Australian and Mining Standard*, dated 18th September, 1919: "The Gold Producers' Association, whose first report, covering four months' operations, was issued recently, was the outcome of representations made to the Federal Government last January by the Australian Gold Producers' Conference, respecting the serious injury to the industry which resulted from the embargo on the export of gold. As a result of these representations the Government agreed to remove the embargo for three months (February-April), on condition that a pool should be formed, and that all *bona fide* gold producers in the Commonwealth should be eligible for membership. The association was registered as a limited liability company on March 6. Later the permit to export gold was extended to July 31, and a further extension has since been granted, but its duration is not stated in the report. Mr. H. L. Wilkinson was sent away in March to represent the Association in the East, and the sales since his arrival there have been carried out through him. For the major portion of the period reviewed in their report 'the Association enjoyed an advantageous position in the Eastern markets, but on 10th June the embargo on the export of American gold (enormous stocks of gold are held) was lifted, and more recently it was reported that consent had been obtained by South African producers to sell their gold in the best markets. How far American and South African or other operations may depress the premiums to be obtained per sovereign for gold abroad cannot be accurately gauged at this stage. Much wider economic forces than the mere competitive selling of producing countries will determine the course of gold prices in our currency. All that can be safely said at present is that the prospects for the current financial period are satisfactory.' The total gold produced by members, as shown by mint certificates lodged up to June 30 (an extension in favour of West Australian producers and New Guinea was made to July 15) was 130,346 standard ounces, valued at £1,675,659. Of this quantity, £816,000 had been shipped and £616,000 sold. The net premium realised on the gold sold amounted to £122,905, representing 15s. 7d. per standard ounce, or, on the production, 5s. 8½d. per standard ounce produced. After deducting the administration expenses of £2,765 7s. 5d., the directors distributed £120,138 5s. 2d., or equal to 5s. 7d. per standard ounce produced, and this sum was divided amongst the various States as follows:—Western Australia, £90,402 5s. 3d.; Victoria, £15,110 3s. 6d.; Queensland, £11,741 9s. 5d.; New South Wales, £1,372 2s. 1d.; Tasmania, £688 14s. 1d.; South Australia, £491 1s. 1d.; Papua, £322 9s. 9d.; total, £120,138 5s. 2d. This sum is not to be regarded by members as a dividend, but as an additional revenue from the sale of gold, and the premium received must be taken into their accounts for the financial period ended with June 30, and a return showing the amount received by each member has been supplied to the Federal Commissioner of Taxation. The board has decided that all members admitted to the end of the present year shall participate in the net returns of that period in common with other shareholders. Regret is expressed at the death, during the first accounting period of the Association, of Mr. T. W. Wellsted, the vacancy on the board having been filled by the election by the West Australian shareholders of Mr. C. Gordon Lyon."

Science and Industry.

It was only right that the services of technical science during the war should be recognised by the appointment of men eminent in the industrial world to the presidency of the British Association and of its Sections at the recent meeting. Sir Charles Parsons began his address by saying that it was twenty-nine years since another engineer, Sir Frederick Bramwell, had occupied the chair, and then quoted a remarkable sentence from Lord Inchcape: "It is no exaggeration to say that coal has been the maker of modern Britain, and that those who discovered and developed the methods of working it have done more to determine the bent of British activities and the form of British society than all the Parliaments of the past 120 years." A tribute to James Watt was only fitting, so near the hundredth anniversary of his death; Sir Charles observed that "to the Watt engine, consuming from five to seven pounds of coal per horse-power, mankind owes the greatest permanent advances in material welfare recorded in history." The inventor had even foreseen the modern turbine, for he wrote to Boulton in 1784: "The whole success of the machine depends on the possibility of prodigious velocities." No one is more qualified to speak of turbine development than Sir Charles Parsons.

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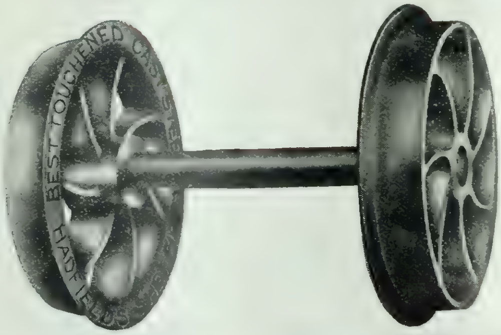

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PROGRESS OF THE "C.M.S." SUBSIDIARIES.

Latest Results from Springs, Brakpan, Daggafontein and West Springs.

The Springs directors' quarterly report for the period ended 30th September, 1919, shows that the linear development for the quarter amounted to 4,555 ft., of which 3,235 ft. were on reef averaging 22·54 dwts. over a reef width of 17·32 in. Of the footage on reef 2,325 ft., equivalent to 71·9 per cent., were in payable areas and averaged 25·10 dwts. over 20·18 in. The net working profit brought down was £48,675 10s. 1d. Note: The net working profit shown above does not include the considerable profit accruing from the premium on the sale of 41,071 ozs. fine gold deposited since the 25th July. No allowance has been made for taxation or the percentage of profit payable in connection with the acquisition of the leased area. No. 3 shaft was sunk 584 ft., making the total depth at the end of the quarter 2,046 ft., of which 2,011 ft. are timbered. During the quarter reefs belonging to the Kimberley series were intersected in the shaft at various depths. The reefs were carefully sampled, but the assay results were quite unpayable. At a depth of 1,996 ft. a pump station was cut. During October the Kimberley slates were encountered at a depth of 2,089 ft. This information, and the data obtained in respect of the position of the reef in the southern section of the present mine, indicate that the Main Reef in No. 3 shaft may be reached during May next, at a depth of about 3,400 ft. No. 4 shaft: It has been decided to proceed with the sinking of a fourth shaft on the company's property, which will be situated south of No. 3 shaft. It is expected that the necessary plant will be ready to start sinking operations immediately upon completion of work at No. 3 shaft. Finance: The expenditure on lease area capital account for the quarter amounted to £48,355 0s. 4d. Under the agreement in connection with the acquisition of the lease area, the Consolidated Mines Selection Company, Ltd., took up during the quarter 39,736 shares in the unissued capital of the company at £3 per share to provide further working capital and funds for the redemption and purchase of debentures. The issued capital now, therefore, stands at £1,193,236. Second annual drawing of debentures: In terms of the trust deed, the second annual drawing of debentures was held at the head office on the 6th August, 1919, when debentures of the nominal value of £17,110 were drawn for redemption at par, being one-tenth of those outstanding on 1st April, 1918. The numbers drawn for redemption were duly advertised in London and Johannesburg in accordance with the trust deed, payment being due on the 1st day of October, 1919. The bonds drawn ceased to bear interest after the 30th September, 1919. During the period under review debentures of the nominal value of £4,555 were purchased. Gold realisation: The arrangement for the disposal of gold to the Bank of England, which had been in force during the war period, terminated on the 24th July, since which time gold has been shipped to London to be disposed of at the best price obtainable. The gold so far sold under the new arrangement has realised a premium of approximately 16 per cent., but the increased profit will only be published quarterly after receipt of account sales. The pre-war practice of debiting the whole of the charges for freight and insurance to gold account has been reverted to; but the charges on a proportion of the gold realised during the quarter had been allowed for at the old rate, and the amount reserved for additional war charges, therefore, showed a credit of £2,321 0s. 9d. The Miners' Phthisis Act, 1919, which came into operation on the 1st August, 1919, involved an increased charge to working costs, the company's contribution for the three months ending 31st October, 1919, being at the rate of £1,349 per month, an increase, based on the average contribution for the previous six months, of £775 per month.

The Brakpan directors' quarterly report for the period ended 30th September, 1919, shows that the linear development for the quarter amounted to 5,463 ft., of which 3,715 ft. were on reef averaging 9·62 dwts. over a reef width of 37·29 in. Of the footage on reef 2,205 ft., equivalent to 59·4 per cent., were in payable areas and averaged 12·88 dwts. over 40·80 in. The net working profit brought down was £78,388 4s. 2d. The net working profit shown above does not include the considerable profit accruing from the premium on the sale of 46,694 ozs. fine gold deposited since the 25th July. No allowance has been made for taxation or the percentage of profits payable in connection with the acquisition of the Brakpan lease and Schapenrust claims. No. 3 circular shaft: During the quarter a distance of 565 ft. was sunk, making the total depth of the shaft 1,801 ft., of which 1,731 ft. are bricked or ringed. The shaft was in the Kimberley series and intersected several reefs, which were carefully sampled. The assay results were quite unpayable. No. 4 circular shaft: During the quarter a distance of 481 ft. was sunk, making the total depth of the shaft 2,334 ft., of which 2,256 ft. are bricked or ringed. At the end of August, the Kimberley shales were encountered at a depth of 2,245 ft. Previous to this, reefs belonging to the Kimberley series were intersected, but the sampling results were quite unpayable. A commencement was made with the cutting of a pump station at a depth of 2,254 ft. Finance: Under the agreement in connection with the acquisition of the Brakpan lease area, the Consolidated Mines Selection Company, Ltd., took up during the period under review 17,000 shares in the unissued capital of the company at £5 per share. The issued capital now therefore stands at £823,600, and 26,400 shares have still to be taken up at £5 per share under the above mentioned agreement. The capital expenditure incurred during the quarter amounted to £38,515. The gold reserve at the 30th September, 1919, stood at 6,724 fine ozs., valued at £28,240 16s. Gold realisation: The arrangement for the disposal of gold to the Bank of England, which had been in force during the war period, terminated on the 24th July, since which time gold has been shipped to London to be disposed of at the best price obtainable. The gold so far sold under the new arrangement has realised a premium of approximately 16 per cent., but the increased profit will only be published quarterly after the receipt of account sales. The pre-war practice of debiting the whole of the charges for freight and insurance to gold account has been reverted to; but the charges on a proportion of the gold realised during the quarter had been allowed for at the old rate, and the amount reserved for additional war charges, therefore, showed a credit of £2,662 9s. 8d. The acute shortage of native labour during the latter half of the quarter was responsible for the reduction in the tonnage crushed. The Miners' Phthisis Act, 1919, which came into operation on the 1st August, 1919, involved an increased charge to working costs, the company's contribution for the three months ending 31st October, 1919, being at the rate of £2,000 per month, an increase based on the average contribution for the previous six months, of £1,322 per month. Dividend warrants in payment of dividend No. 15 of 12½ per cent. (2s. 6d. per share) were issued on the 11th August, 1919.

The Daggafontein directors' quarterly report for the period ended 30th September, 1919, shows that the development accomplished to date is as follows: Total footage, 6,806 ft.; footage on reef, 4,521 ft.; footage sampled, 4,370 ft.; reef width, 11·87 in.; assay value, 22·48 dwts. Of the footage sampled during the quarter, 24·4 per cent. showed payable assays, and averaged 36·96 dwts. over 7·80 in. A similar analysis of the total development to date showed 45·4 per cent. of payable footage, assaying 28·60 dwts. over 16·61 inches. Ventilation conditions at No. 1 shaft were much improved during the quarter. Progress at the development faces, however, was adversely affected by water fissures being encountered on several occasions, necessitating cementation. Good progress was made with the extension of the pumping equipment. The second unit at the bottom station was put in commission, and founda tions for the third unit were completed. The installation of the new 8 in. water column is nearing completion. During the quarter No. 2 shaft was sunk 287 ft., making the total depth 2,363 ft., of which 2,343 ft. are timbered. A pump station and sump were cut at a depth of 2,100 ft. This caused delay and accounted for the comparatively small footage sunk. Various reefs belonging to the Kimberley series were intersected during the quarter; the reefs were carefully sampled, but the assay results were quite unpayable. Work has commenced on workshops, new offices, and recreation hall and grounds for employees. The Rand Water Board purchased 27,809,000 gallons of water during the quarter. During the quarter 400 ordinary shares of £1 each were allotted in respect of options exercised, and the issued capital at the 30th September, 1919, stood at £948,033. Since the close of the quarter, War Bonds of a nominal value of £108,000—which were purchased out of the proceeds of options exercised in London up to the 27th March, 1919, in accordance with the conditions laid down by the British Treasury—have been released by the authorities and sold for £105,957 17s. 11d. The British Treasury has removed all restrictions in respect of dealing in the shares and options of this company, and special settlements have been granted by the London Stock Exchange. The Miners' Phthisis Act, 1919, came into force on the 1st August, 1919. The company's contribution for the three months ending 31st October, 1919, is at the rate of £165 17s. 5d. per month, which is an increase of £61 per month as compared with the average contribution for the previous six months.

The West Springs directors' quarterly report for the period ended 30th September, 1919, shows that No. 1 shaft was sunk 341 ft., making the total depth at the end of the quarter 399 ft., of which 374 ft. are timbered. During the quarter sinking with machine drills was started. Construction work progressed satisfactorily, and included the completion of store yard, change house, transformer house and engine house, and installation of electric light. During the quarter the No. 2 shaft was sunk 180 ft. to a depth of 420 ft., of which 404 ft. are timbered. The shaft was still in dolomite, but there remained only about 45 ft. to be sunk in this formation before reaching the Witwatersrand quartzites. The water has increased to a slight extent; the quantity, however, is still moderate, the pumps now dealing with about 200,000 gallons per day. The erection of the compressor has been completed, and the pumps are now driven by compressed air. The headgear was erected during the period under review, and while this work was in progress sinking operations were retarded. One hoist was put in commission, while another is practically completed. The change house at this shaft was finished and the compound occupied. Details of the quarter's development, together with a summary of the work so far accomplished by Springs Mines, Ltd., in this company's property, under the working agreement, are as detailed below: East haulage, west face: Total footage, 150; footage on reef, 150; footage sampled, 150; reef width, 21·90 in.; assay value, 14·83 dwts. For quarter: Total footage, 150; footage on reef, 150; footage sampled, 150; reef width, 21·90 in.; assay value, 14·83 dwts. Previously reported: Total footage, 630; footage on reef, 630; footage sampled, 610; reef width, 21·20 in.; assay value, 6·43 dwts. Totals and averages: Total footage, 780; footage on reef, 780; footage sampled, 760; reef width, 21·34 in.; assay value, 8·13 dwts. The east haulage, west face, continued to disclose payable ore. At the end of the quarter a distance of 340 ft. had been sampled in the pay shoot, and averaged 12·00 dwts. over 27·83 in. Capital: During the period under review, advance payments of 18s. per share were made in respect of 3,000 shares 2s. paid up, and these shares were issued as fully paid up. The capital of the company now, therefore, stands as follows: 403,000 shares fully paid up; 997,000 shares 2s. per share paid up. Good progress was made at both shafts with the erection of housing accommodation. The British Treasury has removed all restrictions as to negotiability and dealing in this company's shares and in the options granted thereon to shareholders in Springs Mines, Ltd., by the Anglo-American Corporation of S.A., Ltd., and a special settlement has been granted by the London Stock Exchange in both shares and options.

THE

Kalahari Problem.

By AUGUST KARLSON.

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Lord Fisher on Oil Fuel.

In the course of the breezy articles on the Navy, which Lord Fisher has recently contributed to "The Times," he deals in characteristic fashion with the subject of "Oilers or Coaling Stations." Lord Fisher goes the "whole hog" on the internal combustion engine as the prime mover of the future on sea. He says: "There are some idiots who say that oil is limited. Oil is not limited; so long as a pound of coal exists there exists, say, half a pound of oil with further research. My delightful and much-worshipped friend, Sir George Beilby, one of the greatest living chemists, who is as meek as Moses and as thorough as Cromwell, has, with his own money and in his own laboratory, turned 25 tons of coal a day into all its constituent parts of oil, ammonia, and every other nasty thing, leaving a residue which was capable of being made into a combustible for the poor of Glasgow, the size and shape of one's first, at a cost 50 per cent. less than coal, without leaving any ash, and smoke annihilated. When I first heard of it I exclaimed 'Vote for Beilby and a smokeless England!'" For the benefit of "those pig-headed individuals who talk of the scarcity of oil in the world as compared with coal," Lord Fisher observes that "if ever there was a case of proof that we were the lost ten tribes of Israel, it was God's blessing in not allowing us to find oil in England before the war. Millions have been spent in the past on the acquisition and fortifying of coaling stations all over the world, to which we send our colliers from Cardiff with the best Welsh coal. I am not a scientist, but I know it is a practical fact that from the moment coal sees the daylight it begins to deteriorate; and when you send it to some of our coaling stations, such as Perim, in the Red Sea, and other such diabolical places, it is only a short time before it loses all its calorific goodness. Now oil is extraordinarily like port wine—the longer you keep it the better it becomes. The point I wish to develop is that the Almighty arranged for the lost ten tribes of Israel, being the Anglo-Saxon race and the Afghan (and I understand also that part of the tribe of Ephraim is still in the Garden of Eden), that instead of these fixed coaling stations, to which we had to carry coal from Cardiff with continuous deterioration, the ocean should be covered with peripatetic fuelling stations, bringing oil from Borneo, Lobitos on the Pacific Coast, Mexico Trinidad, Venezuela, Persia, Egypt, and heaps of other places."

Prof. Armstrong has since written to "The Times" dissenting strongly from some of Lord Fisher's conclusions. He points out that there may be some difficulty in getting all the oil that the former First Sea Lord asks for. The American oil fields are all but exhausted, and the oil fields of the world cannot well be long lived at present rates of extravagant use. To feed not only the Navy, but also the mercantile marine, with oil will be impossible. As to the possibilities of tar oil, the claim put forward, which is apparently based on absortive experiments on low-temperature carbonisation of coal, carried out by Sir George Beilby a few years ago, is absurd. Our anthracite coals do not furnish a trace of oil, and the highly bituminous at most about 20 to 25 gals. per ton, say, 200 lb. to 250 lb. None the less, Prof. Armstrong agrees with Lord Fisher that all coal should be distilled for oil before it is burnt, but "his suggestion that a smokeless combustible can be made from coal without leaving any ash is moonshine—pure and undiluted. If supplied at the price of the coal it would be cheap; being a more concentrated fuel it would be more valuable than the coal. But even if all coal be washed before it is carbonised, it will not be easy to guarantee less than, say, 10 per cent. of ashes. That coal when exposed, especially in the East, loses in value as an Admiralty fuel, no longer burning with a 'long flame,' is true, but its 'calorific goodness' is not so seriously affected. Oil is not like port wine; like coal, it is subject to oxidation and other changes, especially when made from coal; it does not improve with age."

LATEST FROM MODDER DEEP, GEDULD AND PRINCESS.

Yield and Costs Increase at the Modder Deep—Geduld Shaft Sinking Progress—What the Higher Price of Gold Means.

THE Modderfontein Deep directors' report for the quarter ended 30th September, 1919, shows:—Mine development: Total footage, 1,894; total footage sampled, 1,075; the payable reef disclosures were: 825 ft., having an assay value of 20·3 dwts. over 44 inches. Gold account: The value as shown against gold account does not include the increased price now being obtained from the free disposal of gold. Of the above output £211,453 comes under the new arrangement, on which a premium may be expected. The gold which has so far reached England has been realised at a premium of approximately 16 per cent. The increased profits accruing will be accounted for quarterly after the receipt of accounts sales. Miners' Phthisis Act No. 40 of 1919: This Act came into operation on the 1st August last. The expenditure shown above of £3,527 15s. 7d. is the August and September proportion of the assessment made under the Act, which on the tonnage crushed for those two months is 10·1d. per ton. For the previous two months the amount borne by the company under the old Phthisis Acts was £497 11s. 7d., equal to 1·4d. per ton crushed. Capital expenditure: No expenditure on capital account was incurred during the quarter. Comparison of results: Tons milled, June quarter 126,800, September quarter 127,300, increase 500; working profit, June quarter £161,544, September quarter, £163,346, increase £1,802; working costs per ton milled, June quarter 17s. 11·2d., September quarter 18s. 6·8d., increase 7·6d.; yield per ton milled, June quarter 43s. 5·0d., September quarter 44s. 2·8d., increase 9·8d.

The Geduld directors' report for the quarter ended 30th September, 1919, shows:—Shaft sinking and mine development: Shaft sinking—No. 7 vertical, 79 ft.; No. 2 main incline, 294 ft. Development—Total footage, 4,644 ft.; total footage sampled, 3,450 ft. The payable reef disclosures were: 930 ft., having an assay value of 14·5 dwts. over 36 inches. Gold account: The value as shown against gold account does not include the increased price now being obtained from the free disposal of gold. Of the above output £141,800 comes under the new arrangement, on which a premium may be expected. The gold which has so far reached England has been realised at a premium of approximately 16 per cent. The increased profits accruing will be accounted for quarterly after the receipt of account sales. Miners' Phthisis Act No. 40 of 1919: This Act came into operation on the 1st August last. The expenditure shown above of £2,442 19s. is the August and September proportion of the assessment made under the Act, which on the tonnage crushed for those two months is 6·87d. per ton. For the previous two months the amount borne by the company under the old Phthisis Acts was £747 7s., equal to 2·05d. per ton crushed. No. 7 vertical shaft: At the end of the quarter this shaft had been sunk to a depth of 147 feet by means of a portable winch and boiler. The permanent headgear, boilers, compressor and one of the winding engines are expected to be in commission early in November. Comparison of results: Tons milled, June quarter 128,800, September quarter 129,000, increase 200; working profit, June quarter £62,013, September quarter £60,800, decrease £1,213; working costs per ton milled, June quarter 20s. 2·4d., September quarter 20s. 7·2d., increase 4·8d.; yield per ton milled, June quarter 29s. 9·9d., September quarter 30s. 0·3d., increase 2·4d.

The Princess Estate directors' report for the quarter ended 30th September, 1919, shows:—Mine development, etc.: Shaft No. 1—Sinking, 37 ft. Development—Driving, 205 ft.; winzes, 83 ft.; raises, 69 ft.; crosscuts, 351 ft.; total, 708 ft. The footage sampled was as follows: South Reef, 70 ft. averaging 7·3 dwts. over 28 in.; Main Reef, 300 ft. averaging 7·7 dwts. over 44 in. It is estimated that the payable ore (based on the milling width) developed during the quarter is: South Reef, 6,000 tons; Main Reef, 23,000 tons; total, 29,000 tons. These figures are subject to re-calculation at the end of the year, when block values are made out. Gold account: The value as shown against gold account does not include the increased price now being obtained from the free disposal of gold. Of the above output £68,569 comes under the new arrangement, on which a premium may be expected. The gold which has so far reached England has been realised at a premium of approximately 16 per cent. The increased profits accruing will be accounted for quarterly after the receipt of account sales. Miners' Phthisis Act No. 40 of 1919: This Act came into operation on the 1st August last. The expenditure shown above of £757 1s. 10d. is the August and September proportion of the assessment made under the Act, which on the tonnage crushed for those two months is 4·54d. per ton. For the previous two months the amount borne by the company under the old Phthisis Acts was £408 11s. 8d., equal to 2·46d. per ton crushed. Comparison of results: Tons milled, June quarter 59,500, September quarter 60,200, increase 700; working costs per ton milled, June quarter 27s. 8·4d., September quarter 28s. 7·2d., increase 10·8d.; yield per ton milled, June quarter 26s. 5·2d., September quarter 26s. 9·7d., increase 4·5d. increase.

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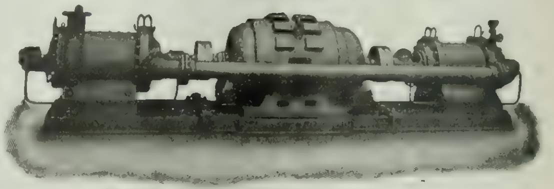

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A REVIEW OF THE MINING INDUSTRY.—VI.

Points from the Report of the Secretary for Mines and Industries for 1918.

In the course of his annual report for 1918 the Secretary for Mines writes:—

V.—Control of Imports and Exports.

Imports: Supplies from United Kingdom.—The difficulties which arose in obtaining supplies of engineering and mining material during 1916 became greater as the war progressed, owing to the increased demand for men and material for the manufacture of munitions. During the year under review the restrictions applied to practically all com modities, with the result that the staff had to work at great pressure to cope with the applications for priority assistance. With a view to economizing in material so far as possible and reducing the demands on the hard-pressed manufacturers, arrangements were made for the pooling of the engineering supplies of gold, coal, and base metal mines with the most satisfactory results. Pools were established in Johannesburg under the auspices of the Transvaal Chamber of Mines, and in Durban, in connection with the Natal Collieries. Amongst the duties of the Pooling Committees was the issue of priority certificates to permit of the importation of essential mining supplies, and it was the duty of the representatives of the Controller of Imports and Exports on those committees to *visé* all such certificates before they were issued. A pool was also established in connection with the sugar estates. The needs of other industries had also to be considered, and Priority Committees were, therefore, established at the main industrial centres throughout the Union. Applications to import goods for which priority was required were submitted by applicants to their respective local Priority Committees. The Committees, after considering the applications, referred them with a recommendation to the Controller of Imports and Exports, whose duty it was, before recommending importation, to satisfy himself that there was a real scarcity of such goods, or that suitable substitutes were unobtainable. I desire to record, with regard to this special work, that the Department has received the whole-hearted co-operation and loyal support of the pooling organizations and local Priority Committees. The number of applications received for priority assistance was 10,491.

Supplies from United States of America.—When the United States of America entered the war, the American Government imposed very drastice restrictions on the export of goods from that country. Not only had the Union importer to obtain priority certificates to assist in the securing of an export permit by the American exporter, but had also to obtain a shipping space priority certificates to assist in the securing of space, when the export permit had been issued. Orders placed in America for value over 10,000 dollars were subject also to special financial arrangements. The number of applications received for priority assistance was 2,666 and shipping space applications 3,178. The pooling organization and priority committees proved of great assistance in helping to cope with the extra work involved by the American export restrictions.

Supplies from India and Australia.—Owing to the exigencies of the shipping position, the available shipping space for India and Australia had to be allotted on a priority basis. As the tonnage allowed was considerably below normal requirements, individual recommendations were made only in special cases and when some particular industry was vitally concerned. The recommendations usually went forward on a collective basis, each commodity being given priority according to the demand or necessity within the Union and a limited tonnage recommended based on such priority.

Exports from Union.—With increased restrictions on exports from other countries and reduced shipping facilities, the necessity for controlling the export of goods from the Union, became more apparent. A great demand was made on Union stocks by all the neighbouring territories of the Continent as far north as British East Africa on the one side and Cameroons on the other. For these territories, as well as Zanzibar, Madagascar, and Mauritius, the Union became the distributing centre. Without control of our exports, we should have been rapidly denuded of our stocks of many necessities—as in fact at one time threatened in regard to certain essential commodities. The desire to assist the territories dependent upon the Union resulted in the appointment of the following recommending officers, who issued priority certificates for my information as Controller of Imports and Exports, much in the same manner as priority certificates were issued here, for the information of controlling authorities in other countries:—Portuguese East Africa, Agent for the Union of South Africa; South-West Protectorate, Secretary for the Protectorate; Southern Rhodesia, Controller of Imports, Salisbury; Northern Rhodesia, Priority Authority, Livingstone; Nyasaland, Chief Secretary to the Government, Zomba; Zanzibar, Chief Supply Officer; Mauritius, Controller of Trade; British East Africa, Chairman, Priority Authority; Occupied East Africa, Controller of Customs, Dar-es-Salaam; St. Helena, Chief Clerk to His Excellency the Governor; Belgian Congo, British Vice-Consul, Elisabethville; Uganda, Chairman, Supplies Board; Sierra Leone, Chairman, Food Committee. The system of recommendation worked well, and in practice meant that no goods went out of the Union for an unnecessary purpose, or for re-export. By regulating export in collaboration with recommending officers, and cutting down excessive orders, the trade so opened up was kept alive. The retention of such trade will depend upon exporters' efforts and the prices charged by them. It is gratifying to record that the Union's requirements never suffered from want of control, from an export point of view, and that the control was really of great assistance in enabling the commercial community to exploit new markets. Such a satisfactory state of affairs was due to the conscientious manner in which the various recommending officers carried out the obligations they contracted with the Union, and I desire to place on record my appreciation of the assistance they rendered. During the year 134,381 export permits were issued, many of which were issued by the Collectors of Customs. To the emergency staff, which was rapidly built up to deal with the administration of the Priority and Import and Export Departments, the greatest credit is due for the remarkable efficiency attained. Invaluable assistance was rendered by the Customs Department, and especially by the Controllers at Capetown and Durban, as well as by the Union Agent at Lourenco Marques.

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CONTROL OF ATMOSPHERIC CONDITIONS IN HOT AND DEEP MINES.[*]

First Report of the Committee—Summary of the Conclusions Reached.

In the present report we propose to make a preliminary general survey of the investigation, and to indicate the lines on which we are working and the detailed points on which information is being collected. Although the human body temperature is extremely steady at about 98° to 99° Fahr., and any abnormality in it causes symptoms of illness, it is well known that men can live in perfect health at air temperatures varying from considerably below zero Fahr. to 120 deg. more; and probably no animal or living organism of any kind can withstand great variations of external temperature, and, at the same time, retain its physiological efficiency as well as a man can. A good deal of experimental investigation remains to be done before the factors, which in actual mining practice limit a man's capacity for normal work, can be defined with precision; but the main facts seem to be fairly clear. Apart from all conscious interference, the living body regulates its internal temperature by several means. The first of these is by regulating the blood flow through the skin. If the temperature of the air is below that of the body, heat is withdrawn from the body by both conduction (including convection) and radiation. The loss by conduction to air tends to vary with the rate of movement and temperature of the air, while the loss by radiation tends to vary with the surrounding temperature. By varying the rate at which blood is circulating through the skin, the body regulates this loss of heat, as in proportion to the cooling of the skin a smaller quantity of cooled blood passes inwards from it, and *vice versa*. It is evident, however, that this means of regulation must fail in a sufficiently warm atmosphere. A further means of regulation depends on the fact that in a cold environment the production of heat within the body tends to be increased by increased muscular activity. But there is a limit to the amount by which the heat production in the body can be diminished. Hence this means of regulation must also fail in a sufficiently warm atmosphere. In warm atmospheres there is a third means of regulation, and this is the most important one in relation to deep and hot mines. As soon as the body temperature tends to rise above normal, there is active secretion of sweat by the skin, and the disappearance of heat in the evaporation of this sweat keeps the skin cool; so that even when the air temperature is far above the body temperature, the latter remains normal if the sweat can evaporate with sufficient freedom. The physiology and physics of cooling by sweating are of such fundamental importance in relation to the subject of this report as to require somewhat detailed consideration. When water evaporates, the amount of heat which is required for its conversion into vapour, or "latent" heat, is, of course, enormous. For the conversion of 1 kg. or 2·2 lbs. of water at body temperature into aqueous vapour at the same temperature, the heat required is 582 calories, or as much heat as would warm 582 kgs. of water 1 deg. cent., or 5 quarts from freezing-point to boiling-point. A miner working at his full normal capacity might produce heat at the average rate of about 250 calories per hour during seven hours' work, as compared with about 70 calories during rest. Hence if the temperature of the air were the same as that of the body, so that he could not lose heat by radiation or conduction, he would require, in order to keep his body temperature normal, to evaporate during the shift about 3 kgs., or nearly 6 pints, or about 1 lb. per hour, of sweat. With a lower temperature the amount of evaporation needed would, of course, be less, as part of the heat, or possibly nearly all of it, would be got rid of by radiation and conduction. Now the body can produce quite easily sweat at the rate of 1 lb. or even 2 lbs. per hour for many hours at a time, provided that sufficient water is drunk. Dr. W. E. Hunt determined recently the average amount of water drunk daily by several healthy Europeans during active outdoor life in India with a shade temperature during the day of about 115 deg., and found that the smallest quantity was 3 gallons, or 30 lbs. Nearly all of this was, of course, lost by sweating. It should be noted that large quantities of sweat may be evaporated without any visible moisture being seen on the skin. In hot and dry climates there is very little visible sweating; and, indeed, it is evident that sweat which drips from the skin without evaporation is wholly wasted. Prof. Osborne, of Melbourne, found that in hot and dry weather in Australia about 1 lb. of sweat per hour may be lost without the skin or clothes being damp. The body carries a large reserve of water in the muscles, so that correspondingly large quantities of sweat can be produced without causing any sensible concentration of the blood; but, after a time, it becomes necessary to drink enough water to replenish the loss; and it is well known that miners in hot mines require a good supply of water. In the hotter Cornish mines each man carries down with him a small cask of water. So far as mining conditions are concerned, the capacity of the body for sweating to the requisite extent is practically unlimited; but the conditions for evaporation of sweat may be altogether defective. Consequently, everything turns on these conditions. It is clear that if the air were already saturated with moisture at the body temperature, there could be no evaporation from the skin, so that no heat could be given off. The body would then be defenceless against heat, and despite profuse sweating the body temperature would drift upwards. If, however, the air were only saturated to a lower temperature—that is to say, if the "dew-point" were at a lower temperature—evaporation from the skin could still occur; and if both the evaporation and the skin circulation were fast enough, the body could get rid of its superfluous heat. Now the rate of evaporation is practically proportional to the rate at which air passes over the moist skin or clothes. If this air were completely stagnant, the aqueous vapour could only escape outwards by the extremely slow process of gaseous diffusion. On the other hand, unsaturated air not only tends to cool down a moist surface towards the dew-point, but also tends by conduction to warm up the cooled surface towards the air temperature; and unless the air current is very considerable, radiation will also contribute appreciably in this direction. The result is that when there is a sufficient air current to swamp the influence of radiation and conduction through still air, the surface assumes a definite temperature between the air temperature and the dew-point; and when no other source of heat or cold is affecting the surface, this intermediate temperature is known as the "wet-bulb" temperature, as it is the temperature assumed by the bulb of a thermometer kept moist with water. The temperature of the moist skin is evidently not the wet-bulb temperature, but something intermediate between the latter and the body temperature, since the body heat is tending to warm the skin. The greater the air current, however, the more nearly will the skin temperature approximate to the wet-bulb temperature if the skin is moist, provided that the heat-flow from the interior of the body to the skin remains constant. As the wet-bulb temperature is the temperature to which a moist surface can be cooled by evaporation in air if the cooling is not hindered, and the wet-bulb temperature may be the same when the air temperature and dew-point are far apart, it is only to be expected that (other things being equal, such as the amount of clothing, the air current, and the production of heat in the body), the effect of warm air in raising the body temperature abnormally will depend on the wet bulb temperature. That this is actually the case was shown by Haldane, who found by observations in a hot disused level at Dolcoath Mine and in laboratory experiments that if the wet-bulb temperature exceeded 88 deg. in perfectly still air, and during rest, with a minimum of clothing, the body temperature rose continuously, and the faster the higher the wet-bulb temperature. What the air temperature, or the dew-point, or the relative humidity were, did not matter except in so far as they affected the wet-bulb temperature. Thus an air temperature of 133 deg., with the wet-bulb at 88 deg., had no more effect on the body temperature than an air temperature of 88 deg. with the air saturated. At both temperatures the body was just able to keep its temperature from rising, and there was profuse sweating; but at 88 deg. most of the sweat failed to evaporate, and was thus wasted. In a further series of experiments at the Doncaster Coal Owners' Laboratory and at Oxford the same observer found that when the wet-bulb temperature was above the body temperature, the rate of rise of body temperature depended also (other things being equal) on the wet-bulb temperature and not on the air temperature. When an air current was present, and the wet-bulb temperature was below the body temperature, it required a higher wet-bulb temperature to cause a rise of body temperature, just as might be expected. But with the wet-bulb above the body temperature, an air current accelerated the rise of body temperature; and with the wet-bulb temperature at 120 deg. or more, a painful burning sensation was produced by moving air or by bodily movements which brought more air into contact with the skin. When muscular work was done, the wet-bulb temperature at which the body temperature began to rise was lower, as could be expected in view of the greatly increased heat liberated in the body during work. In other work, continuous hard work was impossible in still air unless the wet-bulb temperature was considerably below 88 deg. Thus, even with the wet-bulb temperature at 78 deg. continuous fairly hard work in still air was impossible. The wet-bulb temperature at which, with an air current such as might be expected along a well-ventilated working-face, and an amount of work such as an average miner does, the normal body temperature could be maintained was not determined, and remains to be ascertained. Judging, however, from such observations as have yet been made in deep and hot mines, this wet-bulb temperature is not much above 80 deg., and for the purposes of the present report we may provisionally assume it to be 80 deg. In this country the outside wet-bulb shade temperature, in even the hottest summer weather, is seldom above 70 deg., and then only during the hottest part of hot summer days. A wet-bulb shade temperature over 73 deg. is scarcely ever experienced, and such a temperature is exceedingly trying to persons wearing ordinary clothing. In a mine, however, clothing is reduced or discarded as the wet-bulb temperature rises, so that men may be quite comfortable at wet-bulb temperatures of 80 deg. or more. In some tropical countries the shade wet-bulb temperature is often over 80 deg. for several days at a time; but in dry tropical heat the wet-bulb temperature is often below 70 deg., although the shade temperature is 110 deg. or more. It seems evident from the foregoing considerations that in dealing with the difficulties caused by heat in deep mines the chief aim of mining engineers must be to keep down, not the air temperature itself, but the wet-bulb temperature; and a subsidiary aim is to keep the air in motion as far as possible at all working places. We may now consider generally how these objects may be attained, leaving detailed discussions to further reports. With increasing depth, the natural temperature of the strata increases steadily; and a common rate of increase appears to be about 1 deg. in 70 ft., though this is one of the questions on which we are collecting data. Thus, assuming that the mean surface temperature in this country is about 49 deg. Fahr., the natural rock temperature at 2,200 ft. will be about 80 deg. If, therefore, there was very little ventilation, the air temperature would not be less than 80 deg., and the air would be saturated with the moisture given off from the damp strata. Actually, however, the air would be saturated at over 80 deg., as oxidation of coal, timber, etc., would raise the temperature. There would, therefore, be very serious difficulty from the heat. If, however, the ventilation were adequate, the conditions would be very different. . . .

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[*] Abstract of Paper read before the Annual meeting of the Institution of Mining Engineers. The Committee consist of Prof. Sir John Cadman (Convener), Mr. J. T. Browne, Mr. C. Augustus Carlow, Prof. W. G. Fearnsides, Mr. J. Gerrard, Dr. J. S. Haldane (representing the Doncaster Coal Owners' Committee), Mr. G. P. Hyslop, Prof. L. T. O'Shea, and Mr. R. A. Thomas, with Mr. Percy Strzelecki as Hon. Secretary.

The problem of underground temperature control seems to resolve itself into that of adequate ventilation, planned with a clear conception of what is required in order to prevent loss of the miners' working capacity, and not merely to obviate trouble from firedamp or vitiation of the air by other gases. Our investigation is being carried out with this provisional conclusion in view, and we are collecting evidence for the purpose of testing it in every way and of throwing light on all the factors which have to be taken into account in controlling the wet-bulb temperature underground. It is our intention to present further and more detailed reports, both on what has already been done and on future progress. The conclusions reached in the present report may be summarised as follows:—

(1) The hindering effects on men of the heat in deep mines depend, not on the temperature of the air, but on the wet-bulb temperature and the degree of stagnation of the air.

(2) In the downcast-shaft and main intakes of a well-ventilated coal mine the natural temperature of the strata has no appreciable influence either on the temperature of the air or on the wet-bulb temperature.

(3) The data as yet available indicate that by properly-designed ventilation and avoidance of leakage the hindering effects on men of the heat in deep mines can be obviated up to any depths at present contemplated in the working of coal or other minerals in this country.

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THE WEEK IN THE SHAREMARKET.

Diamond Shares in Great Demand—Anglo-Americans Active—London Still Buying.

Despite a more cautious feeling engendered by the latest demands for higher pay and shorter hours by the miners, the market has remained firm during the week. It is thought that the men's demands need not be taken too seriously, as they are subject to debate and discussion, and doubtless represent the maximum the men expect in the best of circumstances. Still they have had a damping effect on business, and it will be a good thing if a settlement can be soon arrived at. It is not surprising that diamond shares should have, in view of the facts, enjoyed the main share of popular favour during the week, and the activity extended from De Beers down to most of the syndicate shares. New Elands provided the most active feature, and enjoyed a notable advance. Frank Smiths are still fluctuating about 7s., though the special meeting in London is said to have sanctioned the reconstruction scheme, and the mine may be working again by the end of the year. Tin shares were inactive, and among gold shares, Anglo-Americans led the van owing to considerable buying from London. Modder Easts and the debentures keep firm, despite the fact that the new issue of the latter have to be taken up by October 31, and all the other Far East Rand favourites remain fairly firm, at a little below best. The following are the changes of a quieter week:

	Fri., 24th.	Sat., 25th.	Mon., 27th.	Tues., 28th.	Wed., 29th.	Thurs., 30th.
African Farms	15 3	16 0	15 0	15 0	15 3	15 0
Anglo-Americans	39 0	40 0	42 0	41 0	44 0	40 0
Apex Mines	7 6*	7 0	7 0	7 0		7 0
Aurora Wests	8 9†	—	8 9†		8 9†	-
Bantjes Cons.	3 0	3 3	3 9*	3 0	3 0	3 1
Brakpan Mines	75 0	75 0	75 0	76 0†	75 0†	71 0*
Breyten Collieries	8 0*	—	8 0	8 0	8 0	10 0
Brick and Potteries	4 6*	—	—	—	—	4 6*
British South Africa	21 6*	22 6*	—		22 0	
Bushveld Tins	2 8	2 7*	2 5	2 0*	2 9	2 7
Cinderella Cons.	5 6*	5 6	5 9	5 6	—	—
City and Suburbans	9 0†	8 9	8 9	8 9†	8 9†	7 6
City Deeps	63 0†	61 0	61 0	61 0†	58 0*	59 0
Clydesdale Colls.	29 0	28 0*			28 6	28 0*
Cons. Investment	—	-	33 9	-	—	-
Cons. Langlaagtes	21 6	21 6*	24 0†	21 6*	21 6	21 0*
Cons. Main Reefs	11 6*	12 0	12 0	12 0	12 0*	11 9*
Cons. Mines Selection	27 9†		27 9†	27 6	—	27 9†
Coronation Freeholds	2 11	2 8	2 11	2 10	2 9†	2 8
Coronation Syndicates	5 0*	5 0*	5 0*	5 0*	5 0*	6 0*
Crown Diamonds	9 9†	8 6*	9 0*	8 9	9 6†	9 3*
Crown Mines	65 0	66 0	64 0*	65 0†	65 0†	63 0
Crown Mines Debentures	£102			—	—	
Daggafonteins	22 6*	23 6	23 6*	23 9	23 3	23 6
Do. Options	7 6*	7 6*	8 3	7 9*	7 0*	7 9
Durban Rood. Deeps	8 6*	8 0*	8 6*	—	—	-
East Rand Coals	3 0	2 11*	2 11*	3 0	2 10*	3 0
East Rand Deeps	—	1 6†	1 2*	1 6†	1 1*	1 2*
East Rand Minings	—	—		—	25 0†	
East Rand Props.	8 0	8 6	8 2	8 0	—	8 9
East Rand Debentures	£65½*	£66*	£65½*	£65½*		£65
Eastern Golds	1 4*	1 8	1 8	1 10	1 6	1 6*
Ferreira Deeps	9 0*		10 0*	10 6	10 6*	10 6*
Frank Smith Diamonds	6 8	7 6	7 6	7 1	7 0	6 9
Geduld Props.	58 0	59 6	59 9	58 9*	58 0	58 0
Gleneairns	—	—			—	1 0
Glencoe Collieries	6 0*	6 0*	6 0*	6 0*	6 0*	6 0*
Glynn's Lydenburgs	15 6*	16 6†	16 0	15 0	-	15 0†
Government Areas	96 9	99 0	98 0*	97 0	97 0	96 6*
Jhb. Board of Executors	33 0*	33 0*	33 0*	33 0*	32 0*	-
Jupiters	5 0†	4 6	4 6	4 6*	4 6*	4 3*
Klerksdorp Props.	—	2 0*		2 0*	2 0*	2 0*
Knight Centrals	6 4*	6 3*	6 6*	6 6*	6 3	6 5*
Lace Props.	21 3	21 9*	22 3	21 3*	21 0*	21 6*
Leeuwpoort Tins	29 6	29 6*	30 0	30 0	29 0	29 6
Lydenburg Farms	-	9 0†	9 0†	8 6	8 6	9 0
Meyer & Charltons	91 6*	91 6*	92 6*	92 6*		-
Middelvlei Estates	2 5*	2 6	2 6*	2 6*	2 6†	2 4
Modder B's	179 0	179 6	178 6*	179 0	177 6	180 0
Modder Deeps	49 9	50 0	50 0	49 9	48 3	49 6
Modder Easts	31 3*	33 0	32 6	31 10½	31 6	32 3
Do. Options (3 years)	12 7½	13 9	13 3*	13 6	12 9	13 3*
Do. Options (4 years)	14 6	15 3*	15 6*	15 0	14 6	15 0*
Hume Pipes	21 3*	22 0	22 6	22 6*	22 3*	23 0
Natal Navigation Colls.	—	27 0		27 0	27 0	27 0
National Banks	£15¼†	—	£15¼†	£15†	£15¼	£15¼†
New Boksburgs	2 6†	1 10*	—	1 10	--	1 10*
New Eland Diamonds	47 0*	47 6*	50 0	49 0*	53 0	55 0
New Era Cons.	—	11 9*	11 9	11 6*	11 3	11 6
New Geduld Deeps	—	2 0*		2 2*	2 3†	2 0
New Heriots	—	8 0*	-	8 0	—	9 9
New Kleinfonteins	11 9	12 3	12 3	12 6	12 3	12 0
New Modders	£29⅜*	£30A	—	£30†	£29⅞	£29
New Unifieds	—		5 6*		5 6*	5 7
Nigels	8 0	8 0*	8 0*		7 0*	-
Nourse Mines	14 6	14 0*	13 3		13 6	14 0
Premier Deferreds	220 0*	—		220 0*	—	220 0*
Premier Preferreds	—	155 0		155 0*	155 0*	155 0*
Pretoria Cements	94 0*	98 0	97 0	95 0*	95 3*	96 0*
Princess Estates	3 0	2 9*	2 10*	2 9*	2 9*	2 6*
Rand Collieries	3 6*	4 6†	3 6*	3 6*	3 6	3 6*
Rand Nucleus	2 0*	2 0*	2 0*	2 0*	2 1	2 2
Rand Selections	76 0*	80 0	80 0A	-	81 0A	85 0†
Randfontein Deeps	5 3*	7 0†	6 6*	6 9	5 6*	6 0
Randfontein Estates	24 3	25 0	25 0	24 6*	23 9	24 0
Roberts Victors	15 0†	14 9†	14 3	15 0†	14 6†	12 9*
Rooibergs	6 3*	6 4	6 6	6 9	6 3*	6 3*
Rose Deeps	19 6*	—	—	—	—	-
Ryan Nigels	—	—	—	—	—	4 0*
Simmer & Jacks	—	5 6*	5 0*	6 0	—	5 6*
Simmer Deeps	2 0*	2 3*	2 3	2 3*	2 3*	2 3*
S.A. Breweries	41 0†	41 0†	41 0†	41 0†	36 0*	38 6*
S.A. Lands	6 9	7 3†	6 11	6 6*	6 6*	6 6*
Springs Mines	56 0	57 0	56 9	55 6	54 9	55 6*
Sub Nigels	22 6	22 6*	20 9	21 6	21 0	20 9
Transvaal G.M. Estates	16 6†	—	—	—	16 0	16 9†
Van Ryn Deeps	88 6	88 3	88 6	89 0†	85 6	85 6
Van Dyks	3 6*	3 7	-	4 0†	4 0†	3 9†
Village Deeps	14 6A	15 6*	15 6*	15 9	—	15 3
Village Main Reefs	9 0†	9 0†	8 6†	—		9 0†
Welgedachts	30 0*	30 0*	30 0*	30 0*	—	30 0*
Western Rand Estates	7 6*	8 3	8 0	7 9	7 6	7 9*
Witbank Collieries	—	—	63 0*	65 0*	68 0*	68 0*
Witwatersrands	—	22 6†	21 6†	19 0*	19 0*	21 0†
Wit. Deeps	10 0*	10 3*	10 3*	10 0*	—	10 0*
Wolhuters	4 1	4 1*	4 1*	4 1	4 1	4 1
Zaaiplaats Tins	7 3*	7 4*	7 6	7 4*	7 3*	7 4
Union 5 per cents.	£106½	£106¼	£106½	£105½†	£105¼*	£105½†
New State Areas	31 0A	31 3*	31 3*	30 3*	31 0*	32 0*
Southern Van Ryns	8 9*	9 0	8 10*	8 9	9 0	8 9*
S.A. Alkalis	35 0*	37 0	35 0*	37 6	38 9*	38 0*
Tudors	1 6*	1 6*	1 9	1 9*	1 9*	1 9*
Tweefontein Colls.	25 0*	25 0*	25 0*	25 0*	25 0*	25 6*
West Springs	26 9	27 6	28 0	27 3	26 9*	26 9
Do. Options	10 3	10 3	11 0	10 7½	—	10 0
Transvaal Delagoa Inv.	80 0*	—	80 0*	80 0*	80 0*	80 0*

*Buyers. †Sellers. AOdd lots. BEx London.

The Knight Central Position.

The report of the Directors of the Knight Central for the quarter ending 30th September, 1919, shows a working loss for the quarter of £6,671, due primarily to the extreme shortage of native labour, which has prevented a larger tonnage output from the mine, and to the increased assessment under the new Miners' Phthisis Act, amounting to £1,086 for the last two months of the quarter. At the end of September the underground native labour force was only 61·2 per cent. of the mine's complement, there being a net decrease of 400 between the commencement and end of the quarter, which is equal to a reduction of 20 per cent. in the underground force. Facilities for a free market in gold have now been obtained, and the results stated above do not include the increased price now being received on the gold shipped since the 25th July last. The gold so far sold, which is equal to a little over one month's output of the Witwatersrand, has realised a premium of approximately 16 per cent. Any increased profits obtained by the company will be published quarterly, after receipt of the account sales. It is impossible to say how long the increased price for gold will be obtained, but it is obvious that, should it continue, the company's immediate outlook will be improved. The ore reserves at 30th June last have been re-calculated, and are estimated to amount to 252,000 tons, of a value of 6·7 dwts. per ton.

GOVERNMENT REPORT ON THE PRIESKA NITRATES.—II.

Judicial Survey of the Origin, Occurrences and Commercial Possibilities of the Deposits—Their Interesting History and the Present Position.

By Messrs. Frood and A. L. Hall.

II.—GEOLOGICAL AND PHYSICAL.

This aspect of the question is more fully dealt with in Part II., and my references to the subject will be purely incidental. The geological conditions affecting the Nitrate-bearing formations are simply those of the most part of the Lower Griqua Town series generally, with which many people must already be very familiar, if only by reason of so much work having been done in recent years in connection with asbestos. Starting from the Orange River, the Lower Griqua Town series is represented by the Asbestos Mountains which trend to the north north-east and by the Doorn Bergen which run north-west. Both ranges consist of low-lying hills, seldom exceeding from five to six hundred feet in height. These hills are broken into by numerous kloofs or valleys, running in all directions, the sides of which have shown a tendency to break away in perpendicular krantzes, which vary in height from a few feet to 100 feet or more. The main krantzes are commonly found flanking the crest of the rise, but these or subsidiary faces may start at any elevation in the sides of the valleys. On particular farms I have seen cliff faces, the aggregate linear extent of which would amount to over four miles, and I probably did not see all. Even if this be very exceptional, the total amount of these faces, in the district regarded as nitrate-bearing, must be enormous. It is in these krantzes or cliffs that the nitrates are found. It should be clearly understood at this point that the nitrate is of the nature of an impregnation or interstitial filling. No suggestion has yet been made seriously, so far as I know, that it is, even in part, an original constituent of the rock; but this does not exclude the case of porous weathered rock that may have been penetrated by nitrogenous solutions and so enriched. In the ordinary case, the nitrate salts are found filling the interstices in the bedding planes of the very hard siliceous shales, commonly called jaspers, which are characteristic of the Lower Griqua Town series. The bedding is generally close to the horizontal, the apparent dip very seldom exceeding 10 deg. The layers of Nitrate, so far as I have seen, seldom exceed a thickness of 2in., but are ordinarily much less, and may be a mere skin. Where, however, the rocks are contorted, or more extensive fissuring has occurred in the face, pockets occur which may yield quite a large quantity. One very important feature is the zone of enrichment that commonly occurs at the base of the cliffs. This zone may extend to 14 or 15 feet in cases, but the average width appears to be about eight, though this last figure is liable to under-estimate owing to the difficulty in examining or sampling the portions of the face either out of reach or covered by the debris lying against the cliffs. Our experience, however, was that there was a tendency to tail off in value both towards the top and bottom of the zone of chief enrichment. It should be pointed out that this basal concentration is a feature of similar occurrences elsewhere, as at Homedale, Idaho, and in other parts of the Western States of America. At the same time, it is apparent to the eye that at places in the krantzes there are further deposits higher up, though of what importance these may be, if any, it is at present impossible to say. It is only on certain sections of the cliffs that anything has been done in the direction of exposing the nitrates in the face. Thus, at Mooipoort we found such a section extending to about 400 feet, at Kloof one of between 200 feet and 300 feet, and at Spitzkop one of 350 feet and two smaller ones. At these rich sections, the faces have been considerably under cut in course of picking out the nitrates, the rock having been removed at places to a depth of as much as 10 feet or more. No doubt the position of the nitrates has been affected by the presence or absence of favourable shelter provided by the overhang of the cliffs above, but to what extent I am not at present able to offer any opinion. It is known that the earth and stone débris at the bottom of the cliffs, of which there is a large amount, all carries some percentage of nitrate, and that in many places the ground is comparatively, or even very, rich. Thus, Mr. Trusler, one of the pioneers of the present activity, informed me that, from the ground in front of a rich cliff section at Spitzkop, he took out one lump of 35 lbs. weight of pure nitrate and several lumps of 20 lbs. and thereabouts. So also, Mr. Olds, the Manager of the Cape Asbestos Company, told us of a chance sample which he took out of the ground at the bottom of some cliffs facing his house at Koegas, the analysis of which showed 13 per cent. total nitrates. To have attempted, however, to come to any satisfactory conclusions as to values on the whole would have required very careful and extended investigation, and it was thought better to do nothing in this direction. It is certain, however, I think, that if it is found profitable to work the cliffs, the underlying débris will prove in places a useful and valuable reserve. Of the nitrates found filling interstices in the rocks and adhering to the faces, the great bulk has the potash base, and much of this, owing to a series of stages of absorption by descending liquors and subsequent redeposition, has attained to a state of considerable purity. One sample I got analysed some years ago showed 96 per cent. $K NO_3$, and this result agrees more or less closely with others I have seen. But, at the same time, a large proportion is also found intermixed with earthy material, varying from light to dark brown or reddish in colour, according to the amount of iron present and whether tending to ferrous or ferric condition. Nitrate of lime is also found, but in much less quantity. Nitrate of Magnesia follows next, but at a considerable interval after lime, whilst Nitrate of Soda only appears to be present in minute quantity. One analysis made some years ago of the earthy material just referred to showed the Solubles in water to amount to 71 per cent., of which 64.2 per cent. was attributed to Potassium Nitrate, 5.3 per cent. to Calcium Nitrate, 1.5 per cent. to Magnesium Nitrate, and a trace only to Sodium Nitrate, but I cannot put forward this analysis as representative of conditions generally.

III.—ORIGIN OF NITRATES.

The one great question, of course, is the quantity of Nitrate in these rocks capable of being economically recovered; but at the present stage, when so little prospecting and exploratory work has yet been done, the question of the origin of the deposits is so inextricably mixed up with other considerations that it is impossible to avoid bringing it into review. The only Nitrates known are: (1) Those found under natural conditions, (2) formed artificially by synthetic chemical processes, and (3) derived artificially from atmospheric nitrogen through the agency of the electric arc. Of these, except with regard to the question of markets and prices, we are only concerned here with the first. The only natural Nitrates known to science are those originating (1) from the decomposition of animal excreta and the decay of animal and vegetable remains, (2) doubtfully, and at the most in minute quantity, from nitrous or nitric acid produced from electric discharges in the atmosphere and brought down with the rain. The functions of different bacteria which convert the ammonia resulting from decomposition first into a Nitrite and then into a Nitrate have been recognised for a considerable time. The functions also of other bacteria, which are found swarming on the nodules formed on the rootlets of leguminous plants, and have the power of taking in the nitrogen of the air and using it in building up some of the albuminous or protein compounds contained in plant tissues, are equally recognised.* These operations are of great physiological importance as bringing Nitrogen into an assimilable condition, but they add nothing to the soil. There are no bacteria known to Science which form nitrates, as such, directly either through fixation of atmospheric nitrogen to available bases or otherwise. From the above, it will be seen that we are forced back very much upon the same position as that taken by Dr. Marloth with regard to the formation of these deposits nearly 25 years ago. One may venture to think, however, that attention need not then have been directed so exclusively to the agency of the Dassie—a fact which has lent itself somehow to a certain amount of ridicule being directed against these Nitrate enterprises, which is entirely undeserved. In course of ages, it may justifiably be surmised that many other forms of animal life must have contributed appreciably to the result of the present deposits. I would also like to suggest, though with some diffidence, that too little weight may have been given to the part played by the decomposition of vegetation, which is known to furnish continually, during its decay, a small amount of Nitric Acid.† If this suggestion can be made good, it will help to explain some of the phenomena in connection with these deposits that otherwise present difficulty.

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*Sir W. A. Tilden, F.R.S., Chemical Discovery and Invention in the 20th Century.

†W. H. Hess, "Journal of Geology," Vol. VIII., p. 129.

(To be continued.)

The British Westinghouse Change of Name.

As our readers are aware, the change of name of the British Westinghouse Electric and Manufacturing Company, Limited, to that of Metropolitan-Vickers Electrical Company, Limited, follows as a result of amalgamation with the extensive Vickers interests and the Metropolitan Carriage, Wagon, and Finance Company, Limited. From its inception in 1899 until 1917 the then British Westinghouse Electric and Manufacturing Company, Limited, was controlled by American shareholders, but in the latter year, as reported in these pages at the time, the American holding was taken over by the Metropolitan Carriage, Wagon, and Finance Company, Ltd., and later amalgamation with the Vickers interests became effected. The company, therefore, becomes entirely British. We are informed that the change of name will not affect the general policy of the company, except that a broader field for advancement will be opened up. The Metropolitan-Vickers Electrical Company, Limited, will carry on just the same, but ultimately and inevitably will proceed to greater development. As a direct result of the amalgamation, much additional strength will be gained. Greater possibilities of competition in the markets of the world for the foreign trade will be effected; and a greater standardisation of engineering products, and consequently a larger and cheaper output, will become possible.

TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Business Quieter—Oils and Colours—Iron, Steel and Machinery—Big Order for Cement Works—Electrical Goods—" No Building Material "—Refrigerators—More Shipping in 1920 than ever before for South Africa.

Business is quieter. It is difficult to find the reason, but there is a rumour amongst the merchants and on the Commercial Exchange that big demands are brewing from the Labour Party in consequence of the high cost of living. One reason that cannot be ignored as to the entire absence of vim in business is that the mines are purchasing very sparingly indeed, as the strictest economy is exercised and, what is more important, is that the reserve stocks are being systematically drawn upon. Therefore we cannot expect anything like activity with the mines before the Christmas dividends are declared and the half-yearly balance sheets prepared. These big prices are a menace to the poorer-grade mines, because notwithstanding the increase in the price of gold it may be lost in some cases through extra charges that cannot be foreseen. Business on the whole is in an indifferent mood, which no doubt will remain until Christmas, unless the Government move towards obtaining increased native labour as recommended by the Low-Grade Mines Commission. Again, prices are so high that merchants will only carry sufficient stocks to meet current requirements.

The Way of Things.

The question of high charges, high rents and high food prices is seriously affecting business. For example, one authenticated case is known where a leading house agent in the customary way obtained a tender for a contract for just under £50 for small repairs and papering a room. The landlord, residing in the country, replied that the contract was altogether too dear, therefore the agent had better apply to a coloured man to make a tender for the work. Other cases are known where the coloured element is entering into the cheaper class of work very liberally owing to the high cost of material and the recognised standard trade union wages. Fortunately this is bringing some of the owners into the field by doing a lot of the odd jobs themselves and even fixing up and colouring out rooms. Seeing that high costs are now being taken as a matter of course, the expense would not be considered overmuch provided it could be passed on, but in many cases this is not practicable. The property market still remains very good, simply because of the great demand for residences, and one can hardly venture to predict when anything like a reaction will take place.

Oils and Colours.

The price of mixed paints has gone up from 10 per cent. to 15 per cent. through the ingredients costing more, chiefly turps. A secondary reason is that the demand is so great for the town and Reef trade. It is almost impossible to get sufficiently well-trained painters for the work, more especially for jobs a few miles away. In these cases good men are required who cannot only do painting but graining, as well as paperhanging, otherwise several men might be necessary for the several jobs instead of one good man. The manager supplying this information said it was almost impossible to obtain men who can handle a brush decently, or what is usually termed the handy man. The price of turps in New York is 117s. for 2-4's, which is dearer than in Johannesburg, to say nothing of carriage and customs. The quotation here is for 2-4's 100s., and 10-1's 110s. Linseed oil, according to one authority, will be plentiful in the early part of December next, when it is also expected to be cheaper. White lead (Canadian) is 95s. per 100 lbs. and 1s. 3d. per lb. in small quantities. Castor oil, first quality, 110s.; second quality, 95s.—97s. 6d. Olive oil, first the market in Johannesburg is bare, but a little Spanish can be picked up at 30s. per gall. O.M. According to the London lists, olive oil per bottle can be obtained slightly cheaper in Johannesburg than there. Grease, imported, £45 per ton; and local, £27½ to £32½ per ton; best American salad oil, 145s.; South American, 125s.; and African, 95s. for 2-4's; lubricating oils, 40s. to 47s. 6d. An assortment of brushware is difficult to obtain, and what can be had is dearer on account of the Russian supplies of raw material being only available very intermittently. Glass is still fairly plentiful, but the British supplies are very doubtful—the position being doubtful in the extreme.

Iron, Steel and Machinery.

The most important feature as mentioned by two responsible merchants was the statement that imported bar iron has no earthly chance with the Transvaal product. This is not altogether surprising, as it was mentioned in these notes a little time since that the railway engineers requisitioned on the Commercial Exchange board for certain quantities of best Yorkshire or Dunswart (Transvaal) iron. The demand for barbed wire has been very great from the agriculturists, making our market quite bare, and further supplies must arrive before our merchants can supply large quantities. Bulb tee standards are practically unobtainable. Imported iron, small sizes, is 35s., and the larger sizes 32s. 6d. per 100 lbs. Bolts are still keeping very steady, and the local factory is making good any bolts that run short in many of the standard sizes. The English bolts are coming more and more into the market, and on account of their being a better finished article are preferred to the American variety even if people have to pay a little more for them. Shovels are not very plentiful at prices ranging from 55s. to 60s. a dozen. As regards the British connection with the Johannesburg mining market, a merchant says that the conditions are beginning to feel strained, because on account of the small quantity of iron, steel and other mining materials coming from Britain the expenses are so heavy that it would create no surprise if English supporters said one fine day: " You had better close down and await more propitious times for the delivery of goods from our manufacturers, and until the difficulty of transport is solved." There has been an order for £20,000 worth of second-hand machinery, such as boilers, tube mills and ball mills, etc., but it went begging because of the absence of the things chiefly required. It was supposed that the order was from a cement works.

Electrical Goods

While tubing remains as scarce as ever—the town being swept bare of it—other materials are coming in, although slowly. The trouble, of course, is that on account of recent strikes and the present unsettled state of labour, manufacturers at Home simple cannot execute orders sent them. Lamps are expected to go higher at the end of the present month and prices generally are firming up. Town and country orders are satisfactory, but owing to the scarcity of materials very little business can be done. A leading dealer states that according to his latest advices from America prices for all electrical materials are going up there; in fact, he anticipates that the United States are going to share the unstable conditions obtaining in England, and that this unsatisfactory state of affairs is likely to continue for some considerable time.

Timber and Building Materials.

The timber position is much the same as last week, as there is an acute scarcity of scantlings, deals, ready-made doors, casements, windows, and other shop-made building materials. The price of short scantlings is 1s. 7½d., mediums 1s. 8d., long lengths 1s. 8½d.; deals, 3 x 9, short 1s. 8d., mediums 1s. 8½d., and longs 1s. 9d. per ft.; floorings and ceilings fairly plentiful at last quotations. Roofing iron is dribbling through from the coast, but each lot is snapped up immediately. It is now sold chiefly to arrive at 1s. 5d. to 1s. 5½d. per ft. for 24 gauge. The general statement is that there is no building material in town, which means that reserves are bare in the yards, excepting for stocks already under contract to builders. All hardware goods, baths and enamelware, as well as fittings, are in active demand and many substitutes have to be accepted. All brass goods are getting scarce throughout the town and already the time has come when brass door and window fittings will have to be fitted in the sweet by-and-bye. Builders' hardware merchants are exceptionally busy —through the building boom.

Second-hand Iron and Timber.

The position in the second-hand iron and timber yards remains exactly as last reported—there is practically no roofing iron and timber in town, and therefore no quotations can be given. It is, however, expected that stocks will arrive towards the end of the present week and thus relieve the end of the present stagnation, for, while orders are coming in freely, it is impossible to do any business in the absence of materials. Already some iron and wood have arrived from the Vogelstruis G.M. Co.

Refrigerators.

A small company, as compared with the great cold storage concerns, is now in the market for some half-dozen boilers and complete refrigerating plants. They have been doing good work quietly in giving cold storage accommodation to the smaller towns and villages of the Transvaal. This should be of incalculable benefit to the farmers and tradespeople to preserve produce and all kinds of eatables, instead of sacrificing them, and more often destroying foodstuffs because of no cold storage accommodation when the sun is burning hot overhead. At present this refrigerating business is only in its initial stages, but it has great future probabilities in regulating supplies and keeping trade in legitimate channels as distinct from speculating which often savours too much of profiteering. This matter must be kept in sight when more details are available.

Shipping.

A call was made at the Union Castle offices, when it was ascertained that next year there will be more ships on the South African route, as compared with pre-war days. Very great efforts are now being made to repair and refit the ships the British Government is now handing back to the company, but naturally after four or five years' war work, the question of refitting is no small affair, especially considering the labour unrest in the Old Country. It is anticipated that all the people now on the list in London will be brought back to South Africa by April next. The point often discussed in commercial circles is the seeming indifference of the heads of our great steamship line in not chartering other ships. But remember the Union Castle has a lot to lose after building up such a unique service during the past half century and more. This subject was quietly touched upon, when it transpired that Sir Owen Philipps, the chairman, had done his best in this direction, but up to the present the charges demanded for shipping had been so enormous that it has been out of the question. Then in getting these tramp steamers ready so much would have to be done in the way of fittings even to bring men alone that the idea had to be abandoned. People visit the Union Castle offices in Commissioner Street daily and complain of insufficient refrigerating accommodation in the present boats and other seemingly simple propositions. But they evidently do this without much forethought or consideration, always forgetting that we have had so much shipping lost during the great submarine campaign. Whether we shall have many new South African lines as apart from the premier one remains to be seen, but it stands to reason that the world will go ahead and the obvious thing is to expect ample shipping during 1920, perhaps rather later than earlier in that year. In conclusion one must not overlook the fact that when the war started the Union Castle line had just the very pick of the boats wanted for the war, and these were quickly commandeered by the British Government, who have been very loath to return them. Hence the heartburnings in London as to the return of our compatriots.

Hand v. Air Drills for Stoping.

In the course of the discussion by the South African Institution of Engineers of a paper on "Hammer Drills for Rock Boring," by Mr. H. S. Potter, Mr. J. H. Veasey gave a large amount of information with respect to modern methods of stoping, and suggested that it might prove economical to adopt a smaller diameter of hole and replace hand drills by light pneumatic hammer drills. In this connection he pointed out that during the year 1918 over 20,000,000 tons of ore were mined from stopes on the fields of the Rand, of which about 8,000,000 tons were produced by hand and about 12,000,000 tons by machine. Assuming 8 tons per machine shift, 312 shifts per year, two native operators per machine, and four holes to a shift's work, it would require 4,800 machines and 9,600 native operators drilling 6,000,000 holes to break this 12,000,000 tons. If it were possible to do the same work with machines requiring only one native per shift, the saving to the industry on these 6,000,000 holes would be about 9d. per hole less cost for native labour, a total of £225,000 during the year, with 4,800 fewer natives. Assuming that these 4,800 natives would be available for other work, about 1,200 of them could be employed on light one-man stoping machines, which at 8 tons per machine shift would yield 9,600 tons per day increased output, or 3,000,000 tons per annum, while the remaining natives, viz., about three-fourths of the total, would be required for steel carrying, shovelling, and tramming the increased output. Again, in regard to the 8,000,000 tons obtained from hand stoping, it is difficult to say how many natives were actually employed on this work. But if it is assumed that one native breaks about 300 tons per annum, it would appear that about 27,000 natives were so employed. Neglecting the odd 7,000 as being engaged on work which might be entirely unsuited for light machines, and assuming that the remaining 20,000 could be used in connection with light machine stoping—allowing as before three-fourths of the total number for steel carrying, shovelling, tramming, and incidental work—5,000 of these natives would be available for light one-man stoping drills, which at 8 tons per machine shift and 312 shifts per year would break 12,000,000 tons, an increase of 50 per cent. over the hand work. It must not be inferred that any reduction in cost per ton mined has been foreshadowed in this last comparison. Hand stoping is one of the most economical methods of mining on these fields, and it is not suggested that a light machine and rig, requiring only one native per machine shift, will be cheaper so long as the old average is adhered to for a shift's drilling. Also it must be remembered that many concerns would not be justified in making the capital expenditure required for the necessary equipment of machines, rigs, hoses, steel, and pipe lines. At the same time it is believed that if these light one-man drills are allowed to do all they can in the hands of trained operators, light machine stoping will eventually be cheaper than hand stoping.

New Patents.

Frederick Catley Bynoe.—Improvements in and connected with superheaters for air, vapour or gas.

Frederick George Pickering.—Improvements in or relating to clip devices for fastening rubber jointing sleeves or the like to metal or other pipes and tubes.

Edward John Pearce.—Sure grip tube holder.

Fred Jago.—Metal covered rubber cushion spring.

Horatio Leonard.—Improvements in the construction of reinforced concrete floors.

Sigismund Rudolph James Maynard.—Improvements in plugs.

Henry Edward Geer.—Improvements in or relating to steam superheaters for marine locomotive like boilers.

Arthur Savage.—Improvements in gate hanging devices and the like.

American Spike Company.—Improvements in railroad spikes.

Louis Joseph Stern.—Improvements in distance indicators for automobiles and other vehicles.

Leon Byron Woodworth, Samuel Thomas Tregezkie, and The Central Mining and Investment Corp., Ltd.—Improvements in magnetic separators.

Thomas Marshall.—Improvements in rotary elevators and the like.

James Wilson.—A new method of manufacturing motor fuel from molasses bonded coal briquettes by low temperature distillation.

William Martin Hughes.—Improvements in liquid coal check values.

Sydney Charles Clayton.—Improvements in and relating to combined sleepers and chairs for railways.

Frederick Conway Farnham Eliot James. Improved luminous sights for machine guns and small arms.

James Wilshir.—Improvements in rotation sleeves or tool holders.

Benham & Sons, Ltd., and Charles Reed Allensby.—Improvements in steam heated radiators.

Marconi Wireless Telegraph Company.—Improvements in methods and apparatus for radio signalling.

Jakob de Rytter Kielland.—Safety nut.

William John Davie Pigg.—Improvements in window fastenings.

Alfred Owen Crozier.—Improvements in the method of and apparatus for cementitious articles.

James Naylor Stables.—Improvements in vehicle wheels.

Louis Hippolyte Auguste Ducasse.—Improvements in tube scrapers.

Arthur Emanuel Fichardt.—Improvements in indicators for travelling vehicles.

Andrew Dickson and Malcolm Stewart Beaton.—Improvements in supplying water to hollow rock drills.

Gerald Kenrick Turton.—Improvements in tube mills discharge screens.

Edward Eardley Ellis.—Spring wedge lock.

Seguin Fisher.—Improvements in mountings for rock drills.

Frank James Redman and James Arnold West.—Improvements in supplying air to furnaces.

Automatic Telephone Manufacturing Company, Ltd. Improvements in or relating to impulse senders.

John Nicolson Gondie.—Improvements in buffing mechanism for file cranes.

Henri Prosper Gerdie.—Improvements in rotary cutting tools.

South African Chrome Industries, Ltd.—Improvements in the preparation of chromium compounds.

Harry August Stockman.—Improvements in positive rotary or displacement pumps.

William Colway.—Apparatus for building *in situ* and section by section and course concrete and like cavity walls.

Thomas Henry West.—Improvements in and relating to carburetting devices.

John White and Arthur William Wall.—Improvements in or relating to internal combustion engines.

John White and Arthur William Wall.—Improvements in or relating to carburettors for internal combustion engines.

Alfred James Jung.—Improvements in or relating to carburettors.

Edward Brice Killen.—Improvements in or relating to suspensions specially suitable for vehicles.

Louis Hippolyte Auguste Pacasse. Improvements in tube scrapers.

Andrew Dickson and Malcolm Stewart Beaton. Improvements in supplying water to hollow rock drills.

Gerald Kenrick Turton. Improvements in tube mill discharge screens.
Edward Parsley Ellis. Spring wedge lock.

Seguin Fisher.—Improvements in mountings for rock drills.
Frank James Redman and James Arnold West.—Improvements in supplying air to furnaces

Arthur Thomas Ellis and Harry Arthur Hands.—Improvements in and relating to the valves of internal combustion engines.

Alphaero Engines, Ltd. Improvements in or relating to internal combustion engines.

Maurice Mathy.—Improvements in or connected with apparatus for heating by combustion without flame.

Maurice Mathy.—A new or improved burner.

Albert Manvers.—Improvements relating to a combined vacuum ejector and vapour condenser.

Joah Haigh Walker.—Improvements in and relating to metal reinforcement for concrete.

Ralph Stanley Whaler.—Improvements in or relating to the cylinder heads of internal combustion engines.

Ralph Stanley.—Improvements in or relating to internal combustion engines.

Ralph Stanley.—Improvements in or relating to the magnetos of internal combustion engines and to the driving provision therefor.

Henry Charlton Jenkins.—Improvements in electrolytic cells.

Railway Electrification.

In a recent address to the members of the Association of British Chambers of Commerce, Major Philip Dawson, whose experience on the Brighton Railway in this respect will be remembered, referred to the extension of electric traction on railways. From his remarks we extract the following: The factor which limits the possibilities of electrification is the capital expenditure involved in the contact, distributing and transmission system and which will be about £5,000 per mile of single track. Interest, sinking fund and maintenance will be chargeable upon this, and this amount will have to be added to the ordinary working expenses and divided over the units of traffic per car, per ton and per passenger or train-mile. How vast this expenditure might be is shown by the fact that there are over 50,000 miles of single track in the country. It is obvious that the denser the traffic the smaller this unit charge becomes. As regards the other operating expenses, including cost of power and maintenance, other things being equal, electrical haulage generally comes out best. An additional point made in favour of electric haulage is that, provided the generating station supplying power can be economically loaded up, electric haulage will tend towards an economy in coal consumption. The most sanguine American partisans of electrification claim a saving of over 66 per cent. in coal on this basis, which would amount to about 10,000,000 tons of coal per annum in Great Britain. Against such a saving must be set off the capital charges already referred to. There is little doubt that in an industrial area where electric supply stations already abound, and where dense mineral, goods and passenger traffic exists, electrification will be good business, so that we may anticipate the electrification of a very large portion of our railways in such areas as Glasgow and the North-East Coast, as well as the counties of Yorkshire, Lancashire, Cheshire, Derbyshire, Staffordshire and parts of Worcestershire, Warwickshire, and South Wales. As regards long-distance electrification, the applications in this country will be far less numerous, as coal abounds and water power is scarce, and electrification will only pay in the case of dense traffic, where the railway load will be such as to provide a good load factor for the power station. There are relatively few lines of this description to be found in this country, and by far the best example, which should serve as a model and from the results of which conclusions for less favourable conditions could be drawn, is that of the London, Brighton and South Coast Railway. This is the one line ready for electrification immediately, as practically all the calculations have been made and the plans and specifications are available; the contracts for the suburban section were let before the war but are not being proceeded with owing to the present uncertainties. The putting in hand of any other electrification would take time, as complete schemes would have to be prepared and contracts let, and there is no other long-distance line as eminently suitable for electrification as that from London to Brighton. The completion of the suburban section would naturally be followed by the electrification to Brighton, for which plans are practically completed, and which would simultaneously result in providing plentiful and relatively cheap electricity supply throughout the whole of the purely agricultural and residential districts served by the railway

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Company Meetings.

SUB NIGEL.

Annual Meeting.

The Consolidated Gold Fields of S.A., Ltd., as the Controlling House of the Sub-Nigel, Ltd., came in for criticism last week at the annual meeting of the shareholders of the latter company. The trouble arose out of a proposal that Mr. W. P. Fisher be elected as a director in the place of Mr. J. Andrew Cohen, retiring, but who offered himself for re-election.

Lieut.-Colonel Leslie Brown presided and he moved the adoption of the report and accounts dealing generally with the workings of the mine during the financial year. The year's development, he said, in spite of footage done, had not had the effect of increasing the reserves, partly owing to the troubles encountered in "D" and "E" Shafts, and partly to the large amount of dead work which had had to be done. Their anticipations as regards the date when the ore reserves would warrant a start being made with the increase of crushing plant were therefore unfortunately no nearer realisation than they were at the last annual meeting. The trouble encountered had certainly been disappointing, but he did not think they need be over pessimistic regarding the present position. At the last annual meeting Mr. Leslie, the consulting engineer, made reference in his report regarding a programme of developing the western area of the mine. He did not consider that by confining the development to the eastern area the prospects of sufficiently increasing the ore reserve in the near future was very promising owing to the occurrence of dykes and disturbed ground. For this reason he urged the opening up of the large dormant western area. The directors had very carefully considered this proposal, but had not been able to fall into line with it. In the first place, the company's finances would not permit of it. Secondly, the Board were definitely committed to the development of the eastern and central area on the original report made by Mr. Leslie early in 1917, and the independent report made by Mr. C. E. Knecht on the proposed increase of claim area and reduction plant.

Mr. Knecht, in his report, stated: "My general opinion as to the value to be attached to the western area of Sub-Nigel is that the preponderance of evidence points to this area being very speculative and doubtful." Up to the present their Board had had no evidence to convince them that the western area had better, or even the same promise as the central and eastern area indeed Mr. Powell, their acting consulting engineer, strongly deprecated opening up the western area at the present juncture. On the other hand he strongly advocated carrying out the original programme and hoped that being further away from the disturbed area, and in view of no abnormal disturbances of ground having been encountered in the sinking of the new vertical shaft, that better mining conditions would be met with in developing that area. In view of the above he (the chairman) was sure shareholders would concur with hte intention of the directors to proceed on present lines.

Mr. W. P. Fisher expressed the opinion that the reports to shareholders were not informative. He reviewed the consulting engineer's report, and said that the Board should give the original scheme approved by the shareholders a fair and reasonable trial. "I think," he added, "it is up to the Board not to break faith with the shareholders in carrying out the original scheme." If the directors had come to the shareholders and had put it to them that money was required for the development of the western area they would have put it up.

Mr. J. Andrew Cohen remarked that the minority of the directors always favoured the development of the area, but were out-voted.

The report and accounts were adopted.

Election of Directors.

The chairman then said that the next business was the election of two directors in the place of Messrs. D. Christopherson, C.B.E., and J. Andrew Cohen, who retired by rotation, but offered themselves for re-election. Another nomination, that of Mr. W. P. Fisher, had also been received.

A shareholder proposed that the retiring directors be re-elected, and another proposed the election of Messrs. Christopherson and W. P. Fisher.

Mr. Cohen enquired how many proxies had been received for himself and Mr. Fisher, and whether any of the latter had been given by the Gold Fields, or their nominees.

The chairman replied, after enquiries had been made, that those received for Mr. Cohen totalled 24,416 and those for Mr. Fisher 29,599. The Gold Fields had not influenced any proxies, he said, in favour of Mr. Fisher.

"Where will they go?" asked Mr. Cohen.

"They are intended to support the election of Mr. Fisher," replied the chairman.

After lengthy discusion, Mr. Fisher was elected to the Board in place of Mr. Cohen.

KNIGHTS DEEP.

The ordinary general meeting of shareholders in the Knights Deep, Ltd., was held on Oct. 30, in the boardroom, Consolidated Gold Fields Buildings, Johannesburg. Mr. C. Hely-Hutchinson, M.C., presided, and there were represented personally and by proxy 371,907 shares out of 743,526 issued.

The Chairman said: Gentlemen,—The working expenditure and revenue account shows a net loss for the year of some £20,000, which coupled with the net expenditure on capital account £6,000 gives a figure of some £26 000 by which the company is worse off for the twelve months' work. In the expenditure and revenue account you will note that the company paid no income or dividend tax, and obtained a refund of tax over-assessed for previous years. Special expenditure due to the war, which consists principally of allowances to men away on service, shows a reduction, and for the current year there will be considerably less payable under this heading. To the amount shown under the heading "Miners' Phthisis Compensation Fund" should be added the sum of £6,000 paid by the company to the Miners' Phthisis Insurance Fund, making a total of £7,500 paid out in this connection. For the current year, under the new miners' phthisis legislation, we anticipate that the company will be called upon to pay between £20,000 and £25,000 under this heading. This is a very serious matter in the case of this company. In spite of a considerably reduced tonnage, the gross operating costs were up by £40,000, the cost per ton being 16s. 11d., as against 14s. 5d. for the previous year. The grade of ore milled, however, increased to 16s. 7d. per ton as against 14s. 9d. for the previous year.

Ore Reserve Position.

While on the subject of grade, I would like to draw your attention to the ore reserve position, which is shown at close on 1,000,000 tons of an estimated average grade of 4.8 dwts. This compares with 1,670,000 tons at 31st July, 1918, of an average grade of 4.43 dwts. This reduction in reserve tonnage is partly due to the exclusion from the reserves of low grade ore previously included and now rendered unpayable owing to increased working costs, and partly to the fact that it has not been possible during the year under review to keep up the rate of development equivalent to the rate of mining. The estimated average grade of the present reserves, as above quoted, is, however, appreciably higher than the grade at which the company is at present working. We have repeatedly had it brought home to us that large tonnages are an essential condition to profitable working in the case of this company's mine. The number, condition and position of the various stope faces make it impossible to work up to the average grade of the reserves and, at the same time, maintain the monthly tonnage at a figure calculated to give the best economical results. It has therefore been necessary in the past and will continue to be necessary in the future to include in the tonnage mined a considerable quantity of low grade ore. A monthly analysis of the past year's work gives a very good example of the importance of maintaining the tonnage. In October, November and December of 1918 the company's operations were very seriously affected by the influenza epidemic. The tonnages for these three months were 75,000, 76,000 and 78,000 respectively, the losses for the months being £7,500, £5,500 and £8,000, or £21,000—i.e., equal to the net loss sustained during the year. Turning to the balance sheet, the capital and reserve accounts remain unchanged. Funds transferred are increased by the expenditure on capital account for the year. On the remaining liabilities the loan of £25,000 from the Consolidated Gold Fields appearing in last year's balance sheet has been repaid, while the balance, which last year stood to the credit of the renewals fund, has been completely absorbed by expenditure during the year. On the assets side, the main difference is the reduction by £15,000 of the cash locked up in stores, which now stands at £74,000. Lastly, an analysis of the balance sheet shows that the balance of £87,500 on appropriation account is made up of £84,000 in the shape of stores, furniture, investments and payments in advance, and £3,500 in the shape of free cash. In this connection the closest attention continues to be given to reducing the large stocks of stores which it has been necessary to hold during the war, and as time goes on we may expect further reductions.

Shortage of Natives.

The company has been embarrassed by the shortage of natives. The average percentage of complement employed during the year was 75 per cent. as against 81 per cent. for the previous year. For September, 1919, the percentage employed had fallen to 64 per cent. In the current year results have not as yet shown any appreciable improvement. The premium which gold mining companies are at present getting on their gold should, however, assist to tide the company over until better working can be secured, and will enable the company to spend money on essential development work. In this connection it will probably be found necessary to clean out and continue the sinking of the Lohse south incline to open out two further levels in that portion of the mine and to increase the monthly expenditure on development by about £700. In addition, as very little room remain for the extension of the existing sands dump and the creation of a new dump will be very costly, it will be necessary to expend a further £2,500 in sinking a new borehole for sandfilling purposes This work should enable the company to sent the whole of the balance of its tailings under ground at a less cost than the present surface disposal enails, in addition to strengthening the underground workings. Your attention is drawn to the remarks in the report of the acting consulting engineer with regard to the necessity for stable industrial conditions if the mine is to continue working. But for the gold premium (and it is impossible to say how long that may last) the mine is on the margin of payability, and cannot stand for any further increase in the cost of production. Indeed this margin is so small that even with a fair labour supply any untoward circumstances such as accidents underground convert a monthly profit into a loss. The management are making every effort to improve the duty per white and native employe, which during the war has fallen appreciably and with the return of the company's employes from service we may, I hope, look for better results in this connection. We must, however, remember that with the exhaustion of ore in the upper levels, there are, apart from questions of labour efficiency, increased physical obstacles to improvements in this direction. In conclusion I should like to express our congratulations to those of our employes who have returned safely from their services in the war. Of the 250 who left us for that service, 180 have returned to our employment, 30 have died on service, and up to a short while ago 40 were still to return. The cost of allowances made to employes on service is close on £40,000. Your thanks are due to Mr. C. D. Leslie, your consulting engineer for the period under review; to Mr. O. P. Powell, the superintending engineer; Mr. G. A. Chalkley, the manager of the mine; Mr. G. M. O. Barclay, who has recently acted during Mr. Chalkley's absence, and to the respective mine and head office staffs concerned. It is to the credit of these gentlemen that in spite of all the discouraging conditions under which they have had to work for the past year they have never allowed their keenness or energy to flag. Mr. C. D. Leslie has now severed his long connection with the Consolidated Gold Fields, and Mr. O. P. Powell has assumed the duties of acting consulting engineer to that company. I now beg formally to move the adoption of the report and accounts.

The report and statement of accounts were adopted.

Messrs. D. Christopherson, C.B.E., and A. G. Gill were re-elected to the directorate.

Messrs. Douglas, Low and Co., and Mr. Chas. Stuart were re-appointed auditors.

CORONATION COLLIERIES.

In moving the adoption of the report of the directors and the accounts at the annual meeting of the Coronation Collieries Oct. 17 Major Bagot said he was glad to be able to submit to shareholders a most satisfactory statement. It was true that the profit disclosed—£33,388 16s. 3d.—was less than that shown in the previous year by about £2,218, but it must be noted that the profit for the past year was after writing off an amount of £4,919 16s. 9d. expended on prospecting operations. ith regard to the purchase of the coal rights on Springboklaagte for a sum of £9,500, the directors had realised for some time that the present Coronation property was approaching the end of its life, and that when in a few years' time its coal seams were exhausted it was essential that the Company should possess a coal property to take its place They would find in both the directors report and the mine manager's report a fairly full description of the property and of the steps which had been taken to ascertain its posibilities as a coal producer. He would add that Dr. E. T. Mellor, who inspected the property on behalf of the Company, was able to confirm their opinions both with regard to the extent of the coal area and the workable width of the coal seam. With regard to the quality of the coal the results of both calorific and practical tests gave them good grounds for believing that in Springboklaagte they had secured a property capable of carrying on the life of the Coronation Collieries. After dealing with the profit and loss account, the chairman said he would like to say a word about the prospecting work done in the Piet Retief district. In that they had again the valued assistance of Dr. E. T. Mellor, who supervised the boring operations. The quality of the coal disclosed in the open workings and subsequently revealed in certain of the boreholes induced the company to endeavour to prove the extent of the coal field; two seams of good width and of excellent quality were discovered, but the country proved to be broken and the coal area restricted. In view of the fact that the property was situated at a distance of 15 miles from the railway, the Board felt that no further expenditure was justified and consequently abandoned their options. It would be remembered that in 1918 the Company purchased the freehold of 355 acres of the original Coronation property. That had enabled them to reduce the pillars under this ground, and as a result the acreage worked out namely 15 acres had been about the average area worked out during the two prevous years, the acreage still unworked is now 65 acres.

The introduction of a 48 hours week for all underground European employes on the Collieries had been the subject of negotiation between the Collieries Committee of the Transvaal Chamber of Mines and the representatives of the Mine Workers' Union for some months past. The difficulties which the Collieries would have to face in the event of their acceding to that demand were very considerable. In the first place the granting of a 48 hours week must inevitably reduce the hours worked by the native labour force. It was estimated that the reduction of hours would diminish the average output of the Collieries by from 15 per cent. to 20 per cent. In order to make good that loss two means only were possible, an increase in the native labour force and the installation of additional machinery. The additional native labour could only be obtained by depriving the gold mines, a course which with the existing shortage of native labour was not a practical proposition. The installation of additional machinery was obviously a matter which could not be undertaken at short notice, for many months to come the supply of new machinery, and its shipment from Europe, would be difficult. If the principle of a 48 hours week was the right one, it would no doubt be eventually conceded, but in his opinion the change was one which would have far-reaching effects, and as such, should only be brought about very gradually. So far as the Coronation Collieries were concerned the life of the mine was too short to admit of an extensive scheme of new plant and the colliery would have to depend on an increased supply of native labour in order to maintain its output.

Since their last annual meeting they have had great cause to be thankful for the end of the war. Of their European staff at the mine, 11 out of a total of 34 had been serving at different times in the various theatres of war. He was very glad to say that all had now returned safely, and had resumed their work at the mine.

The report and accounts were adopted, and Major Bagot and Mr. T. G. Otley were re-elected directors.

Trade and the Exchange.

The sharp rise in the American exchange and the continued fall in the Continental exchanges have had a very disturbing effect on trade. At first it was thought that America would benefit from the high value of the dollar, but it soon became clear that business men in the United States were getting alarmed. In June the exports from the Republic reached the enormous total of 918 million dollars, or 200 millions above the previous record, while imports were only 293 million dollars, leaving a trade balance of 625 million dollars to be settled somehow. A year ago the balance was very large, but it did not seem so serious, because the Washington Government had arranged to lend some 3,500 million dollars to foreign countries. But these credits must be nearly exhausted, and henceforward, as the National City Bank of New York says in its monthly " Bulletin," credits must be provided in some other way. At the date of the " Bulletin " the moneys of the chief countries stood at the following discounts in New York: Britain, 10 per cent.; France, 30 per cent.; Italy, 39 per cent.; Germany, 74 per cent.; even neutrals like Norway and Denmark have to admit discounts of 11 and 17 per cent. These percentages represent the cost to residents in these countries of turning their own moneys into dollars when they want to buy something in the United States. This is unpleasant for them, but it acts also as a handicap on American sales in those countries.

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Notes and News

New Far East Mines.

A Springs correspondent writes that with the coming of the new year several new gold mining companies will commence operations, these including the Cassel-Clydesdale and Grootvlei Companies. It is further stated that a new State area lying between Geduld and Grootvlei, *i.e.*, the eastern portion of the Geduld farm, will be put up for tender at an early date.

* * * *

The Premier's Record Report.

The financial year of the Premier Diamond Mining Company ended on October 31, and it is understood that the figures for the period will show that the company has enjoyed a most profitable—if not the most profitable—period of its existence. The result, needless to say, is due to the careful control of the output which has had so much to do with the splendid prices ruling for the stones.

* * * *

The Coal By-Product Industry.

The coal by-product trade appears to be on the eve of considerable expansion. In addition to the Natal Ammonium—the pioneer company of its kind—it is understood that another Natal coal company has in view the erection of a large battery of Coppee ovens to make coke and other by-products of coal. In our last issue we gave particulars of the South African Carbide and By-Products Company of London, with a capital of £307,500, all of which had been guaranteed, to manufacture calcium carbide, ammonium sulphate, tar and other by-products at another Natal colliery. And it is understood that here, as well as in Natal, other companies have similar projects in view.

* * * *

"S.A. Engineer and Electrical Review."

The current issue of the *South African Engineer and Electrical Review* is of particular interest, in view of the decision to electrify the S.A. Railways. Unique and exclusive articles from the pen of Messrs. Merz and McLellan, the well-known experts, deal with many phases of this now very "live" topic, and the whole issue is one of the best that has appeared. Among the special articles included are the following: "The Cost of Electrifying the S.A. Railways," "Recent Developments in the Supply and Use of Electricity," "Power Station Sites for S.A.R. Electrification," "Recent Industrial Progress in the Union," "Types of Electric Locomotives for the South African Railways," "New Trams for Johannesburg Municipality," "Meter Works of a Municipal Electric Supply System," "Points About Air Receivers," "Recent Triumphs of the Hammer Drill," "Agricultural Engineering," "Leakage Resistance of Electric Railway Roadbeds," and "Power Supply for Factories in South Africa." The paper is now on sale at the Central News.

* * * *

Improved Coal Prospects.

Describing the prospects of the coal trade at the Clydesdale meeting this week, Mr. Mackie Niven said: "Since the conclusion of the war the prospects of the Administration receiving some of the rolling stock on order for so long would appear to have improved; and with regard to the more pressing need, that of locomotives, they were informed that a number had recently been delivered, and were being erected in the workshops, while about one hundred and forty-five were due for delivery before the middle of next year. In addition to that, the return of so many men from oversea had enabled the authorities to man their workshops better and the number of locomotives always under repair was being considerably reduced. The administration claimed, therefore, that very soon now they might look for an improvement in the condition of affairs so far as rolling stock was concerned, and they were hoping that that may be realised."

A Greater Iron and Steel Industry.

We understand that it has been decided to extend the Pretoria iron and steel industry to realize its full possibilities, and that capital running to one and a half millions is assured for the undertaking. It is noteworthy, in this connection, that Mr. Mackie Niven, speaking at a colliery company meeting last week, said: "Several small blast furnaces have been erected in the Transvaal during the past two years and these had, from native ores, been turning out about 10 tons of pig iron per day. These experimental plants had demonstrated that pig iron, of first class quality could be produced in this country. The pre-War price of pig iron in Britain was so low that manufacturing was not possible. The price now was very high. Authorities did not anticipate it would be likely to fall to anything like the old price, perhaps not lower than double the old price, for many years to come, if ever. The question of establishing a large iron and steel industry in South Africa was therefore being seriously considered—a decision was not likely to be taken in a hurry, as it might involve the expenditure of millions of money. If it should come about, the demand for coke for furnace purposes would be very great and it had been established that they had coals that would make good coke. It would appear probable that the by-products industry was also likely to make considerable progress before long."

* * * *

S.A. Railway Electrification.

In his speech at the annual dinner of the South African Institution of Electrical Engineers, recently, the Minister of Railways pointed out that we in this country were six years overdue with new railway construction. The time had come when they had to face the necessity, the urgent necessity, of embarking upon a scheme of new railway construction. It was a truism to say that this country could not be developed as it should be unless they provided the necessary means of communication, and he would tell them that in the mind of the Government it was necessary that when a new scheme of railway construction was introduced it should not be an ordinary hum-drum Railway Bill, such as they had had in the past, but they should have a bold and comprehensive scheme of railway construction. Regarding the electrification of our railways, Mr. Burton mentioned the opinon of the expert Mr. Merz, who had stated that he knew of hardly any country which was so favourably situated for the electrification of its railways as South Africa. It was the intention of the Government to carry out the recommendations made by Mr. Merz at the earliest possible opportunity, and, said the Minister amid laughter, he trusted that one of the results would be—perhaps it would be only one of the minor results—that there would not be so many complaints about the shortage of trucks between here and Durban. He thought that when the electrification was carried out the change which would be brought about would be revolutionary. It would in most cases double our carrying power, and would have a most beneficial effect on the country.

* * * *

Rhodesian Mining Notes.

Natives employed on Rhodesian mines in August show a decrease of 3,457 as compared with the corresponding month in 1918, but is 1,486 better than for July. The Rhodesian Chamber of Mines having asked the Secretary for Mines for a ruling in regard to the responsibility for the payment of wood contractors' native wages, have been advised by that official, that in his view, the mineowner is responsible for the payment of these wages in case the contractor fails to pay them. It is held that a contractor is really an employee of the mine, and the mineowner must be held responsible in case his contractor fails to carry out his obligations to the native labour employed under him. The local banks have now stated that they are prepared to purchase gold as hitherto at 77s. per standard ounce, but will account to producers for any surplus in excess of 78s. on realisation, less the current rate of exchange on such surpluses. This arrangement will date from October 1st. Mr. B. W. Durham has been appointed as the representative for the Lonely Reef G.M. Co., Ltd., *vice* the late Mr. S. H. Boright. The African Asbestos Mining Co., Ltd., with its head office at Bulawayo, has been formed to take the place of the South African Asbestos Co., Ltd., which has gone into voluntary liquidation. The change came into effect on the 1st October. The total value of the gold and other mineral yield from Southern Rhodesia during the month of September was £294,149, as compared with £268,864 for the previous month of August.

* * * *

Sub Nigel Shaft Strikes Reef.

On Wednesday night the reef was struck in the deep level shaft at the Sub Nigel, and the details of assay values and width will be published as soon as available. It will be remembered that this vertical shaft was started in 1918 to open up the lower levels together with the Grootfontein area of 500 claims, which was chosen as being in line with the extension of the most promising ground of the Sub Nigel. The following are the particulars of the development for the quarter ended 30th September, 1919: Total footage developed, 4,576 feet, namely: Off reefs, 780 feet; on reefs, 3,796 feet. Of the above 3,796 feet on reefs, 3,450 feet were sampled, of which 1,190 feet were payable, averaging 11·8 dwts. over a stoping width of 42 inches; the balance, namely, 2,260 feet, was unpayable, averaging 3·3 dwts. over a stoping width of 42 inches. The details of the payable footage are appended hereunder; the value in each case being over 42 inches:—"B" Shaft: 16 east drive, 85 feet, value 8·1 dwt.; 17 east drive, 80 feet, value 12·9 dwts. "C" Shaft: 16 west 4 rise, 105 feet, value 14·0 dwts.; 17 west drive, 175 feet, value 24·1 feet; 17 west 4 rise, 85 feet, value 14·6 dwts.; 18 west drive, 310 feet, value 8·2 dwts.; 18 west 1 rise, 55 feet, value 6·4 dwts. "D" Shaft: 14 west 3a rise, 15 feet, value 8·9 dwts.; 14 east 3 rise, 50 feet, value 7·5 dwts.; 14 east 3 winze, 20 feet, value 6·9 dwts.; 14 west 3 a winze, 60 feet, value 5·9 dwts.; 17 east drive, 20 feet, value 8·7 dwts. "E" Shaft: 16 west drive, 130 feet, value 10·0 dwts.; total, 1,190 feet, value 11·8 dwts.

* * * *

Canada's Trade with South Africa.

A demonstration of the possibilities of inter-Dominion trade (writes a correspondent of *The Times* trade supplement) is afforded by experiments between Canada and South Africa during the past five years. Figures cited by the Canadian Government Trade Commissioner, Mr. W. J. Egan, who is revisiting Canada for official purposes, show some extraordinary results from efforts to promote such trade. From the geographical and climatic points of veiw the two sister Dominions are very far apart, but for this reason there is all the greater likelihood of them being able to develop reciprocal commercial relations. When Mr. Egan took up his new appointment in 1913, the first weakness he discovered was that Canadian firms were not represented in South Africa. "Representation" was made the keystone of his building up system, so that whereas at that time there were only 14 companies represented, to-day there are 238 Canadian houses represented, while the value of the annual export trade from Canada to South Africa has risen from an average of 3,200,000 dollars to 9,704,000 dollars. It is by no means only essentially Canadian products that have been shipped to South Africa during these five years. As a matter of fact, all sorts of manufactured articles, ranging from heavy locomotives for the Government railways to horse-shoes for the back-veld farmer, have been sent to Capetown and Durban. The Elder-Dempster Line gives Canada a bi-monthly service to Capetown. The steamers run from St. John, New Brunswick, in the winter, and from Montreal for seven months of the year. Mr. Egan made it clear that Canada is not relying upon South African trade on the ground of lack of industries in the sister Dominion, but rather on the assumption that its increasing industries will create all the stronger link in the matter of reciprocal trade relations.

TOPICS OF THE WEEK.

THE CONFERENCE AND THE QUESTION OF HOURS.

The conference of employers and employed at Pretoria this week seems to be fulfilling a useful purpose in letting off steam. Mr. Malan's opening address was somewhat cryptic, and has been differently read in different quarters. His intention, at any rate, was good, and his speech gave the gathering a useful lead. Whether anything tangible is to result from the deluge of oratory remains to be seen, but the debate on the question of shorter hours seems to have taken a practical turn and to have evoked some very plain speaking. We printed last week the Mine Workers' Union demand for a forty-four hours' week, and refrained from commenting upon it in view of the pending Pretoria discussion. The arguments on both sides seem to have been fairly stated at the Conference, and Mr. A. French, who is a Vice-President of the Chamber of Mines and a prominent figure in labour discussions in recent years, did not mince matters in stating the case for the mines. Mr. French appears to have begun by making it clear that he was not a believer in long hours, as such, but in the particular case of the mines he showed that the present hours could not be further reduced. He pointed out that some mines were working at a loss, and if the employees were to get the extra benefits now demanded they would close down fifty per cent. of the mines. There was another section of workers, he said, which had been overlooked. There were nine or ten natives to one European on the gold mines. Under the existing regulations the mines could not get more than a working shift of five or six hours out of the natives. The proposal for a 40 hours week underground would mean a 24 per cent. reduction on the actual working time of the native. They had 21 mines working at a loss, exclusive of charges for miners' phthisis, etc. It was an actual working loss. Mr. French reminded the Conference that some years ago they reduced the surface hours to 48, and the hours of the European miners to 48½ bank to bank. That had had an effect on efficiency and production. He hoped the effect would be temporary, but it had existed already a year and a half. If such a small reduction in working hours involved a loss of efficiency and production, it must be a very serious matter to bring the 48 hours to 40. He said that it would result in the closing of a large section of the mines. He admitted that the industry had had the pleasant experience of late of getting a premium, but even with that some of the low grade mines were working without a margin of profit, or at a small loss. Although that premium realised 16 per cent., the increased cost of stores and labour since 1918 had increased the cost of an ounce of gold 20 per cent. During the War in some of the low grade mines a large quantity of the better grade ore had been taken out, and to-day these mines were gutted of richer ore, and their position was worse than five years ago. Mr. French concluded by stating that the application of the 40 hours' underground would be disastrous to the mines, and to the workers themselves, and that no State control or nationalisation would help in that respect. Mr. Townley Williams, of Natal, and Mr. S. C. Black, on behalf of the coal mines, also dwelt on the great loss of efficiency and cost involved in the proposal. Their proportion of coloured workers to Europeans was greater than on the gold mines. The proposal would shut down a large number of collieries and make many others practically unworkable. The whole question turns of course, as Mr. Chappel put it, on the amount of work done, not on the time occupied in doing it. Direct evidence bearing on the point was given by Sir George Albu at the annual meeting of the General Mining and Finance Corporation recently. In their statement to the Low Grade Mines Commission he said that they had mentioned the lower efficiency which they were now getting on the mines as compared with pre-war standards, and especially since they reduced the working hours of their employees. Their technical adviser was closely examined on that point by several members of the Commission, and there was a tendency to question the correctness of his statement. Sir George showed that his views were confirmed by figures which had since been compiled on behalf of the industry as a whole, and which proved conclusively that since the inauguration of the shorter working week, at the commencement of 1918, there had been a reduction of 15 per cent. in the output per native employed on tramming and shovelling—apart from losses of efficiency in other directions. These are plain facts and facts are "chiels that winna ding." In this matter of hours the mining industry has plainly come to the limit of its endurance, and any further reduction can only result in its partial disablement.

Capital for Madagascar Oil.

A portrait appears in the London *Weekly Times* to hand by last mail, dated October 3, of Mr. John Martin, who is described as the discoverer of oil in Madagascar. In the City column of the same issue particulars are given of the flotation of the Premier Oil Fields, Ltd., with a capital of £3,750,000, which is presumably to develop Mr. Martin's discovery.

* * * *

Oceana Development.

The report of the Oceana Development for the year to December 31 last states that the company's financial position has continued to improve, and the mortgage on farms of £3,000 outstanding at December 31, 1917, has been paid off, leaving the company's properties entirely unencumbered. During the year 1918 further surface rights were disposed of, amounting to 3,383 acres. The sale price (£2,294) of these surface rights has been applied in reduction of the cost of land account. The land assets of the company now comprise 45,686 acres in freehold, together with the mineral rights over 9,610 acres. The accounts show a loss of £60, increasing a debit balance brought down to £20,077, which is carried forwrad. Far East Rand properties: Notice has been received from Dr. H. Sauer that the borehole on Eendracht has intersected the Van Ryn Reef at 2,625 ft., and that in accordance with the advice of the consulting engineer, boring had now been stopped. The values obtained in the borehole were low, but the records of a large number of boreholes put down on the Van Ryn Reef of the Far East Rand prove that the striking of payable values in boreholes on this reef is rare, although in every case when subsequently adequate development has been done, extremely high values have been obtained and successful mines established. In the opinion of the consulting engineer, the section obtained in the Eendracht borehole has established beyond question the position of the Van Ryn Reef on the property. With the cessation of hostilities the directors are actively proceeding with the investigation of the Congo Concession. Since the date of the balance sheet the directors have disposed of the company's holding in the Orion Development Co., Ltd., at cost, and this item will in due course disappear from the company's accounts. At an extraordinary general meeting held on January 21 last, Messrs. H. C. Emery and S. S. Kennedy retired from the board, and Messrs. Albert M. Oppenheimer, Robert Bleloch and Dr. Hans Sauer were elected directors. As, however, Dr. Sauer found it impossible to give the necessary time to the company's affairs he retired in April last, and Sir Henry Dundas, Bart., was appointed to fill the vacancy, and was subsequently elected chairman. Sir Henry Dundas, Mr. Robert Blelcoh and Mr. Albert M. Oppenheimer now retire from the board in terms of the company's articles of association, and, being eligible, offer themselves for re-election. A resolution will be submitted to the meeting asking shareholders to confirm the vote of 500 guineas made to Messrs. Emery and Kennedy at the extraordinary general meeting of shareholders above referred to.

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IMPROVED RETURNS FROM THE E.R.P.M.

Increasing Profits—Working Costs Reduced.

The affairs of the East Rand Proprietary Mines appear to have improved somewhat recently: the profits at any rate are substantially better. The tonnage milled has been on the ascendant, working costs have been reduced, and although the revenue per ton has exhibited a tendency to decline, both the aggregate profit and the profit per ton have improved. In May of this year the E.R.P.M. milled 110,000 tons for a revenue of £141,313, or 25s. 8d. per ton. Costs ruled at 24s. 8d. in that month and the company earned £6,077, or 1s. 1d. per ton. Next month the tonnage was a little better, the grade was a shilling higher and the profit earned was £8,535, or 1s. 6d. per ton. In July 125,000 tons were crushed, costs were reduced to 22s. 5d. and the profit advanced to £10,083. In the disjointed month of August working expenses went up to 23s. 7d. per ton and the profit was substantially less at £4,014, or 8d. per ton. September, however, witnessed a marked improvement. Although the revenue on the unit basis was only 23s. 10d., expenses were reduced to 21s. 7d. and the resultant profit was £13,337, or 2s. 1d. per ton. The profit for October was £15,000, which is a further substantial rise. The report for the quarter ended with September 30, 1919, contains an interim appropriation account which shows that in the nine months ended with September, 1919, the balance by working expenditure and revenue account was £70,653. This is an encouraging result and compares well with the working profit of £52,916 earned for the whole of last year. The interim (abridged) balance sheet shows that at the end of September the company had sundry assets of £189,149, and cash on hand, on deposit at bankers, value of gold in transit, and investments equivalent to £903,997. At this date the debentures outstanding amounted to £814,324 as compared with £835,620 at the end of last year. In the three months ended with September 3,592 feet were driven, sunk and risen, and 2,415 feet were sampled on the reef. Payable disclosures were as follows: Main Reef Leader, 920 feet, width 26 inches, assay value 16 dwts.

SOUTH-WEST DIAMOND FIELDS COME UNDER ANGLO-AMERICAN CORPORATION'S AEGIS.

Official Details of Big Amalgamation Scheme—Messrs. Hull and E. Oppenheimer's Success.

We are officially informed that the following is the position of the diamond industry of the South-West Protectorate: Under the aegis of the Anglo-American Corporation of South Africa, Ltd., in which Messrs. J. P. Morgan & Co., the American financiers, are interested, an amalgamation has been arranged between the following group of companies operating in the South-West Protectorate: Pomona Diamenten Gesellschaft, Koloniale Bergbau Gesellschaft, Deutsche Diamenten Gesellschaft (including the interest of Halbsche de Gesellschaft), Diamenten Pacht Gesellschaft, Diamenten Aktien (including Neue Hansa Gesellschaft), Verenigie Diamanten Minen Aktien Gesellschaft, Dahnselder Diamanten Gesellschaft, Grubenbahn Gesellschaft. The interests held by the Deutsche Koloniale Gesellschaft are also included in the amalgamated company; but as this is one of the concession companies the rights and titles of which the Government intends to investigate by a Concession Commission shortly to be appointed the official approval as far as this company is concerned is standing over for the present. A limited liability company with a nominal capital of £3,500,000 will be formed and registered in Capetown under the name of the "Consolidated Diamond Mines of South-West Africa, Ltd." This company will acquire and take over all the assets of the above-named German companies. The effect of this transaction will be to transfer the control of these very extensive diamond fields from Berlin to the Union of South Africa. The Government after very carefully considering the application and inquiring into the position of these different companies has signified its assent to the transaction generally with the reservation that until the Concession Commission has reported on the position of the Deutsche Koloniale Gesellschaft the transfer of the assets of that company to the new corporation cannot yet be sanctioned or could only be sanctioned subject to the reservation that the title is being inquired into.

Electric Traction in the U.S.A.

The power demand for the electrical operation of the steam railways in the United States in 1914 would amount to [illegible] million units per annum, and would require 40 million tons of coal. The coal equivalent of the coal and oil actually burned as fuel was 140 million tons, so that the electrification would achieve the saving of 100 million tons per annum. According to the *General Electric Review*, on locomotives for freight and slow-speed passenger service it is probable that geared motors mounted directly on the axle will be continued; for high-speed passenger work the motors would be preferably of gearless design. The collection of current presents no great difficulties, and tests show that no arcing is produced when collecting [illegible] amps at 3 miles an hour, or even up to 60 miles an hour. The Manufacturers Railway System in St. Louis (Mo.), a private terminal railway with about 24 miles of track, handling 60,000 freight cars annually, is being electrified throughout. The electric locomotives, which are smaller than the steam locomotives formerly employed, weigh 83 tons each, and are capable of hauling a 1,600 ton train (40 loaded cars) at 15 miles per hour. The cost of the change will be 200,000 dollars for the poles, trolley, etc., and [illegible] dollars for six locomotives. The *Electric Railway Journal* of May 3rd last publishes a table in which the 1912 and 1917 census [illegible] on electric railways in the United States are divided on a geographical basis. The largest growth in single track, cars and power output was in the West-North-Central and West-South Central sections. Wages generally increased more rapidly than employees, to the last degree in the Mountain section. The passenger gains were heavier in the East than in the West; the car-miles heavier in the West than in the East. In all sections, the operating expenses increased faster than the gross income, and in the West and the South this was true of income deductions. The best financial results were obtained by the South Atlantic States and the worst by the New England, Mountain and Pacific groups.

The directors of the National Bank of South Africa, Ltd., have declared an interim dividend at the rate of 7 per cent. per annum for the half-year ended September 30, 1919.

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POSITION AND PROSPECTS OF ZAAIPLAATS TIN.

Unsatisfactory Development Results—Valley Alluvial comes to the Rescue.

THE results of operations of Zaaiplaats Tin Company for the past year may be summarised as follows: Mill of 15 stamps ran on 290 days; ore mined, 23,213 short tons; waste sorted, 1,019 short tons; ore milled, 22,194 short tons; concentrates produced, 539 long tons; concentrates purchased, 2·7 long tons; average value of concentrates produced, 70·4 per cent. metallic tin; refined metal produced, 331 long tons. The policy of smelting has been continued throughout the year, and the company is supplying the South African Railways with the whole of their requirements of metallic tin. The work of removing the overburden from the tin-bearing area in the valley has now been completed, and regular outputs from this area should commence in October. The working profit for the year amounted to £34,651 18s. 9d. A further sum of £256 8s. 5d. was derived from rents and interest, while the following additional expenditure has been written off: Allowances paid to men on active service, £277 13s. 7d.; bonus to manager as voted by shareholders at the last annual general meeting, £1,050; donations, £100; directors' fees, £1,492; Government royalty, £3,652 2s. 9d.; leaving a balance of £28,336 10s. 10d. which, with the amount carried forward from the previous year, has been appropriated as follows: Dividend No. 18 of 30 per cent., £19,125; reserve fund (additional amount), £5,000; expenditure on fixed assets, £5,107 12s. 2d.; total, £29,232 12s. 2d. At the end of the year the balance to the credit of the appropriation account amounted to £16,836 8s. 8d., as compared with a balance of £17,425 1s. 3d. standing to the credit of this account at the 31st July, 1918. The total amount standing to the credit of the reserve fund now amounts to £15,000, and this sum has been invested in Union Government 5 per cent. (Taxable) Local Registered Stock and on fixed deposit with the National Bank of South Africa, Ltd. One dividend, No. 18, of 30 per cent., was declared during the year. This was equivalent to 1s. 6d. per share and absorbed £19,125. The total amount paid to shareholders since the inception of the company now amounts to £377,250, equal to 625 per cent.

Mr. W. J. Gau, the consulting engineer, writes: "As you are aware, the bulk of the ore supplied to the mill is obtained from the main workings in the No. 13 section, which up to the end of the third quarter of the year was of good grade and highly profitable. A decided change in the mineralisation of the ore body then took place—antimony and other sulphides, as well as large quantities of specular iron, made their appearance, accompanied at the same time with a marked decrease in the quantity of tin ore. Development was vigorously pushed ahead with the object of passing through what was at first considered a zone of local impoverishment; but it is regrettable to report that after six months of exploratory work no improvement has taken place, the results up to the present being disappointing, no payable tin ore of any consequence having been met with, and the future outlook is, in my opinion, disquieting. As will be seen from your manager's report, practically no assistance could be obtained from the other sections—development results being uniformly unsatisfactory. Parable ore to keep the mill fully supplied was not obtainable and the operations of the company for the last five months have therefore been conducted at a loss. It has been considered necessary to curtail milling operations pending the accumulation of sufficient ore on which to run the mill from time to time, but it is hoped, with the additional output now being obtained from the valley alluvial, that operations will be carried on without financial loss, while further essential development operations will be continued with a view to the re-location of payable ore in the mine."

Mr. Gilbertson, the manager, *inter alia*, writes:—"The ore body in No. 5 section continued erratic throughout the year. On the whole the ore won was barely payable. Dewatering of the main face of No. 6 section was completed. The ore body, which consists mainly of fluorspar, is poor in tin and no improvement was observed. Development is being continued. The pipe discovered in the connection drive, between No. 6 and No. 12 sections, was followed to a depth of 80 feet. A small amount of tin was present at first, but latterly the pipe matter became barren. Apart from the absence of tin, the pipe is promising in appearance and further development is being carried out. Up to the middle of March developments in No. 13 section were very satisfactory. About that time sulphide impurities appeared in considerable quantities in the main face. The tin values also declined, and in May no payable ore was available. Smaller quantities of ore were subsequently cleaned up in subsidiary faces. Exploratory work was pushed ahead vigorously on all likely indications, but up to date without result. The main face carries a strong body of specular iron, but no tin. Numerous small patches of tin were encountered in stoping beneath the second level in the T.C.L. lease. By close sorting the ore was brought up to milling grade. No permanent or large ore bodies have been discovered in this section since work was commenced three years ago. Advantage was taken of the plentiful labour supply to reopen the old pipe in No. 23 section in June. A strong body of pipe matter exists, but no tin. Operations in the valley alluvium were delayed over two months on account of the influenza epidemic. At first it was intended to treat the alluvial deposit as a whole, but later the removal of overburden separately was found to be an easier and more economical method of treatment. At the end of July 43,500 cubic yards of overburden had been removed. The tin-bearing wash has now been reached and the production of concentrates is proceeding satisfactorily. The Mauss centrifugal separator was fitted with new gears towards the end of the year. The machine has not been subjected to heavy loads pending the wearing in of the gears. A Senn pan-motion concentrator was installed to take the place of vanners. The performance of this machine has been highly satisfactory, and it is probable that vanners will be entirely displaced. Slime treatment was carried out mainly on cement frames. Further progress in the process of remodelling the slimes plant could not be made on account of war conditions. Sulphide impurities gave much trouble towards the end of the year. No entirely satisfactory method of removing the antimony was discovered. The situation was eventually relieved by a large decrease in the amount of impurity encountered."

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THE LATEST RESULTS FROM THE CENTRAL MINING GROUP.

New Modder, Modder B., City Deep and other Progress Reports—Bantjes Cash Position.

ATTACHED to all the reports of the Central Mining group for the quarter ended September is the following: "Facilities for a free market in gold have now been obtained and the results stated above do not include the increased price now being received on the gold shipped since the 25th July last. The gold so far sold, which is equal to a little over one month's output of the Witwatersrand, has realised a premium of approximately 16 per cent. Any increased profits obtained by the companies will be published quarterly after receipt of the account sales, but it is impossible to say how long the increased price for gold will be obtained."

NEW MODDERFONTEIN.

The report of the directors of the New Modderfontein shows the following results:—Total footage, 4,553 feet; total footage sampled on reef, 2,355 feet. The payable reef disclosures were as follows: Main Reef Leader, 2,005 feet; width, 14 inches; assay value, 59·5 dwts. Due entirely to shortage of native labour, the output for the quarter showed a reduction of 27,000 tons compared with the preceding period. Working costs were consequently 1s. 3d. per ton higher against an increase in yield of 1s. 11d. per ton milled, the profit for the period being £22,357 lower. The average number of natives employed underground was 3,038 as against 3,778 in the June quarter. Development operations continue to disclose ore of very satisfactory quality. The first assessment has been received under the Miners' Phthisis Act, 1919, for the quarter commencing 1st August, 1919, under which largely increased compensation is payable. The profit for the quarter has been arrived at after charging working costs with the increased assessment for the last two months of the quarter, namely, £5,526.

MODDERFONTEIN B.

The report of the directors of the Modderfontein B. shows the following results: Total footage, 5,008 feet; total footage sampled on reef, 2,905 feet. The payable reef disclosures were as follows: Main Reef Leader, 1,910 feet; width, 24 inches; assay value, 32·6 dwts. Compared with the preceding quarter, the tonnage milled increased 2,500 tons, the yield was 1s. 7d. lower, working costs 8d. per ton milled higher, and the total working profit £16,184 less. Development operations continue to yield satisfactory reef disclosures, particularly in the western section of the mine. The heading from the Geduld Proprietary Mines advanced a further 270 feet, disclosing a lower grade of ore, viz., 291 inch-dwts. This heading is now in dyke; its total advance to date being 945 feet, with an average of 38 inches of reef, assaying 17·7 dwts. or 672 inch-dwts. Construction work at the new vertical shaft was completed as far as essentials were concerned, and sinking has commenced. The depth of the shaft at the end of the quarter was 100 feet. The first assessment has been received under the Miners' Phthisis Act, 1919, for the quarter commencing 1st August, 1919, under which largely increased compensation is payable. The profit for the quarter has been arrived at after charging working costs with the increased assessment for the last two months of the quarter, namely, £3,648.

CITY DEEP.

The report of the directors of the City Deep shows the following results: Total footage, 4,304 feet; footage sampled on Main Reef Leader, 1,920 feet. The payable reef disclosures were as follows: Main Reef Leader, 1,350 feet; width, 35·7 inches; assay value, 14·2 dwts. The south shaft was sunk 537 feet during the quarter, and its depth at the end of September was 1,024 feet. The native labour supply improved slightly as compared with the previous quarter, but it is still unsatisfactory. The first assessment has been received under the Miners' Phthisis Act, 1919, for the quarter commencing 1st August, 1919, under which largely increased compensation is payable. The profit for the quarter has been arrived at after charging working costs with the increased assessment for the last two months of the quarter, namely, £3,922.

NOURSE MINES.

The report of the directors of the Nourse Mines shows the following results: Total footage, 3,989 feet; total footage sampled on reef, 2,070 feet. The payable reef disclosures were as follows: Main Reef, 110 feet; width, 43 inches; assay value, 6·9 dwts. Main Reef Leader, 900 feet; width, 25 inches; assay value, 11·9 dwts. South Reef, 490 feet; width, 31 inches; assay value, 14·0 dwts. The average number of natives employed underground showed a reduction of 213 as compared with the preceding period, and the scale of operations were consequently further restricted. Added to this, the yield was unusually low, with the result that a loss of 3,790 was incurred for the quarter. The first assessment has been received under the Miners' Phthisis Act, 1919, for the quarter commencing 1st August, 1919, under which largely increased compensation is payable. The profit for the quarter has been arrived at after charging working costs with the increased assessment for the last two months of the quarter, namely, £2,598.

ROSE DEEP.

The report of the directors of the Rose Deep shows the following results: Total footage, 1,125 feet; total footage sampled on reef, 832 feet. The payable reef disclosures were as follows: Main Reef, 273 feet; width, 29 inches; assay value, 9·5 dwts. Main Reef Leader, 141 feet; width, 13 inches; assay value, 16·6 dwts. South Reef, 250 feet; width, 23 inches; assay value, 10·7 dwts. Main Reef

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Leader and South Reef, 6 feet; width, 51 inches; assay value, 6·1 dwts. The first assessment has been received under the Miners' Phthisis Act, 1919, for the quarter commencing 1st August, 1919, under which largely increased compensation is payable. The profit for the quarter has been arrived at after charging working costs with the increased assessment for the last two months of the quarter, namely, £1,512.

CONSOLIDATED MAIN REEF.

The report of the directors of the Consolidated Main Reef shows the following results: Total footage, 6,850 feet; total footage sampled on reef, 4,510 feet. The payable reef disclosures were as follows: Main Reef Leader, 2,745 feet; width, 9 inches; assay value, 44·2 dwts. South Reef, 35 feet; width, 22 inches; assay value, 33·6 dwts. The 21st ordinary general meeting of shareholders will be held in the board room, second floor, the Corner House, Johannesburg, on Thursday, 27th November, 1919, at 11 a.m. The native labour supply continues to be very unsatisfactory. The first assessment has been received under the Miners' Phthisis Act, 1919, for the quarter commencing 1st August, 1919, under which largely increased compensation is payable. The profit for the quarter has been arrived at after charging working costs with the increased assessment for the last two months of the quarter, namely, £2,230.

GELDENHUIS DEEP.

The report of the directors of the Geldenhuis Deep shows the following results: Total footage, 712 feet; total footage sampled on reef, 555 feet. The payable reef disclosures were as follows: Main Reef, 40 feet; width, 48 inches; assay value, 10·6 dwts. South Reef, 280 feet; width, 20 inches; assay value, 30·4 dwts. Advantage has been taken of the improved price for gold to increase the amount of development work. The labour supply continues to be unsatisfactory. The first assessment has been received under the Miners' Phthisis Act, 1919, for the quarter commencing 1st August, 1919, under which largely increased compensation is payable. The profit for the quarter has been arrived at after charging working costs with the increased assessment for the last two months of the quarter, namely, £1,800.

DURBAN ROODEPOORT DEEP.

The report of the directors of the Durban Roodepoort Deep shows the following results: Total footage, 2,458 feet; footage sampled on reef, 2,060 feet. The payable reef disclosures were as follows: Main Reef, 895 feet; width, 29 inches; assay value, 14·7 dwts. South Reef, 925 feet; width, 6 inches; assay value, 70·6 dwts. Milling operations during July were almost at a standstill whilst the repairs at No. 1 shaft incline were in hand. For the succeeding two months native labour was extremely scarce, the average number of natives employed underground for the period under review being 1,820, as compared with 2,114 for the preceding quarter, the shortage being more particularly felt in September. Under the circumstances operations were much disorganised. The greater part of the working loss incurred took place in July, during the period of shaft repair work. Development operatons were well maintained under the circumstances, with good reef disclosures in both reefs. The new circular shaft was sunk 516 feet to a total depth of 1,130 feet. The first assessment has been received under the Miners' Phthisis Act, 1919, for the quarter commencing 1st August, 1919, under which largely increased compensation is payable. The profit for the quarter has been arrived at after charging working costs with the increased assessment for the last two months of the quarter, namely, £746.

BANTJES CONSOLIDATED MINES.

The report of the directors of the Bantjes shows that the total gold recovered for the quarter from the cleaning up of the reduction works was 489 ozs. These operations are still being continued. The exploratory drive which is being continued by the Consolidated Main Reef has now reached a total distance of 913 feet from the Consolidated Main Reef's own boundary. The cash in hand amounts to £75,184.

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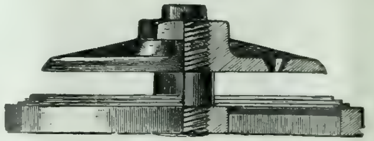

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THE COST OF ELECTRIFYING THE S.A. RAILWAYS.

Consideration of the Price Basis—Fluctuations in Copper—Comparative Working Expenses.

In the course of their report, Messrs. Merz and McLellan write:—In working out the estimates in detail, it has been necessary to consider what price basis to adopt. At the present moment it is impossible to foresee what current prices are likely to be at the time when contracts may be placed for the generating plant, locomotives and other material requisite for carrying out the electrification of any section. Towards the end of 1918 prices which had been steadily going up during the whole period of the War had reached a level approximately 100 per cent. above the pre-War level, the cost of some materials having risen rather more than this and of others less. In the future it is reasonable to anticipate that prices will sooner or later go down again; but it may be taken for granted that they will not in the immediate future, if ever, return to the general pre-War level. After careful consideration we have thought it best to work out all the estimates on the basis of an all-round increase of 50 per cent. on pre-War prices, except where the cost of any work depends to a large extent on the price of copper, such as that of the distribution system. Prior to the War, the basis price of electrolytic copper was in the neighbourhood of £60 to £70 per ton. During the War the basis price was for some time above £130 per ton. For the purpose of our estimates we have assumed that drawn copper wire suitable for transmission and distribution lines would be purchased at the rate of £120 per ton including delivery to South Africa. This rate would correspond to a basis price for electrolytic copper of about £90 to £95 per ton depending on freight charges and other factors.

Copper Prices.

In considering the estimates it will be useful to be able to calculate how far the cost of the distribution system will be modified by reason of any variation in the price of copper from the assumed value of £120 per ton delivered. We have therefore inserted at the bottom of each column in Table VII. Part IV., a figure which shows the tonnage of copper required for the distribution system of that section.

Locomotives and Wagons.

For the prices of new and existing steam locomotives and wagons we have assumed the same ratio of increase above pre-War values, viz., 50 per cent. New locomotives are charged for at 50 per cent. above the pre-War contract prices for each class including the cost of transport to South Africa and of re-erection in the railway workshops. The credit for existing locomotives is calculated on their present book value (*i.e.*, original cost less depreciation) plus 50 per cent. In most of the sections considered there would be a large number of engines released. At the present stage it is difficult to form any close estimate of this credit, as individual locomotives are sometimes transferred from one division to another, and frequently work for only part of their time on any particular section. We have thought it advisable, therefore, to assume a uniform figure for the depreciation of all engines displaced, and we have taken this at 50 per cent. Thus the credit for a locomotive costing originally £6,000 has been taken as £3,000, plus 50 per cent., *i.e.*, £4,500. The cost of new wagons will depend to a certain extent on the type of wagon purchased. We understand that the large majority will be high capacity coal wagons suitable for a load of about 80,000 lbs. From particulars and prices supplied to us by the Chief Mechanical Engineer it would seem that an average figure for modern wagons used in South Africa was before the War about £9 per gross ton (tare plus load). We have therefore based our estimates on an average price of £13 10s. independent of the type of wagon selected. It will be seen that the principal item in the gross outlay is the cost of rolling stock, and further that the net outlay on rolling stock after deducting the credit on account of steam engines and wagons is very small. As both the gross outlay and the credit for rolling stock are affected to an equal extent by the assumed increase above pre-War prices, it is clear that so far as the principal item of new material is concerned the exact ratio of increase assumed is comparatively unimportant.

Comparative Estimates of Working Expenses.

In order to arrive at the estimates of saving in working expenses to be expected as the result of electrification, it is necessary to take into account only those items of expenditure which are affected by the change of system. The costs for each section are given in Table VI. Part IV., and are dealt with under the following heads, some of which apply to steam working, some to electric working and others to both: Coal for locomotives; water for locomotives; electrical energy; wages of drivers, firemen and guards; running shed expenses; lighting and heating charges; repairs of locomotives; depreciation of locomotives; depreciation, maintenance and working expenses of sub-stations; maintenance of track equipment; shunting. The costs for steam working have been calculated throughout on the basis of figures supplied to us by the expenditure office in Johannesburg, modified in certain sections to allow for alterations in the working of the traffic, *e.g.*, by the completion of new deviations now in course of construction. These modifications are referred to in detail in the sections in Part III. dealing with the traffic arrangements in each division. The method of arriving at the working expenses with electric working will be made clear by the following general remarks.

Electrical Energy.

The power required for electric locomotives and trains is calculated in detail for each section from the amount of traffic—goods, passenger and shunting—to be dealt with in accordance with the figures supplied to us. Due allowance is made in all cases for the gradients and curves, the direction of movement of the loaded traffic, and the possibility of reducing energy consumption by regeneration.

A Big Contract.

The Rand Water Board minutes of the 248th meeting on 24th October, 1919, shows that, in accordance with finance regulation No. 32, it is reported that the following tenders were opened on the date mentioned: Contract No. 175—Supply of barrage gates and accessories, Vaal River scheme (tenders opened 1st October, 1919): Messrs. Wm. Hosken & Co.; Sykes & Co., Ltd.; Robertson & Moss (American International Steel Corporation); Reunert & Lenz, Ltd.; Stewarts & Lloyds (S.A.), Ltd.; R. M. Dowson, Ltd.; Harvey & Russell, Ltd. (P. & W. MacLellan, Ltd.); Blane & Co)., Ltd.; Hamilton Bridge Works, Ltd.; Dominion Bridge Co., Ltd.

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MAKGANYENE DIAMOND RECONSTRUCTION.

In view of the refusal of the owner of the farm Makganyene to agree to extend the period during which the Makganyene Diamond Syndicate has the right to complete the purchase of 500 morgen, including the mine, by paying £9,300 (being the balance of the purchase price, viz., £10,000), and in view of the consequent position that on or after 27th November next the company will only have three months further, that is, until 27th February, 1920, in which to purchase the 500 morgen and the mine, at the increased price of £15,000 and 5,000 shares, the directors have resolved, subject to the confirmation of the shareholders, to sell the syndicate's rights under the new contracts over Makganyene, together with the plant and equipment, to a new company, to be styled "The New Makganyene Diamond Company, Limited," the authorised capital of which will be £75,000 in 75,000 shares of £1 each, to be allocated as follows:

	Shares.
To Makganyene Diamond Syndicate, Ltd., for rights under contract as aforesaid	50,000
To provide working capital	25,000
Total	75,000

Of the 25,000 working capital shares, 10,000 will be offered for subscription at par and the Makganyene Diamond Syndicate, Ltd., will give one vendor share to each subscriber of £1 working capital share at par, that is 10,000 vendor shares to the subscribers of £10,000 working capital. The subscribers to the working capital in the new company will also have the right of option for a period of three months from the date of registration of the new company to purchase *pro rata* further 10,000 shares at par, leaving 5,000 shares free to be dealt with by the company. Of the 10,000 working capital shares thus offered 5,000 are already guaranteed by the directors. The diamonds in hand, which form a parcel of magnificent quality valued at 125s. per carat, remain the property of the Makganyene Diamond Syndicate, but upon realisation, which will be effected during the month, the Makganyene Diamond Syndicate will have the right to subscribe to the working capital of the new company an amount equal to the realised value of the diamonds in terms of the offer above mentioned. Since the diamonds were valued some four months ago, market prices have risen considerably and the value to-day is probably about £7 10s. per carat.

It is hoped that before the date of the meeting now called an up-to-date report on the property by the present manager, Mr. James West, will be ready for information of shareholders; meantime the board feels justified in stating that the prospects of the mine never looked better. An area of about 170 claims has been proved to date, and the extensions north and west, where the walls have not yet been met, may bring the total area up to 250 claims or even more. Operations on the new extension on the western side of the mine are opening up an area of very fine yellow ground, the test washings from which indicate a return of over 5 carats per 100 loads, an area less than one-quarter of the mine so far exposed is now known to give 1½ to 2 carats per 100 loads, and the returns from the remainder indicate a return of from 3½ to 4 carats per 100 loads. The area showing the finest quality of yellow ground giving yields indicating 5 carats or more appears to cover about one-third of the total mine area. Preference in allotment will be given by the directors to the present Makganyene Diamond Syndicate shareholders, and to those holding options over shares in the Makganyene Syndicate, Ltd., and such shareholders and holders of options are advised to lose no time in filling in applications for the number of shares they wish to obtain, as it is practically certain that the issue will be over-subscribed, inasmuch as the directors are prepared to take up one-half of the total issue.

Mr. H. W. Adler, underground manager of the Rose Deep, has been appointed manager of the City and Suburban.

* * * *

Mr. K. B. Quinan has been appointed consulting engineer to De Beers' Explosives Works at Somerset West. Mr. Quinan is now on his way back from his shooting trip in the Congo.

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THE OCTOBER GOLD OUTPUT: GROUP RETURNS.

Central Mining/Rand Mines Group.

The following are the results of crushing operations of the Central Mining/Rand Mines companies for the month of October:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Total Fine Ozs.	Total Estimated Profit.	Estimated Working Costs per Ton.
City Deep	A154	10	60,000	25,787	£30,094	26/ 3
Cons. Main Reef	220	6	46,100	17,417	9,104	27/ 9
Crown Mines ...	660	26	182,000	58,946	59,647	20/ 9
Dur. Rood. Dp..	100	3	21,900	7,112	*4,647	31/ 7
East Rand Prop.	440	19	134,000	37,937	15,051	21/ 6
Ferreira Deep ...	160	7	33,400	10,829	4,504	24/ 6
Geldenhuis Deep	300	7	45,400	12,109	*2,586	24/ 3
Knight Central .	120	3	23,000	7,370	388	26/ 6
Modder B.	B104	8	59,000	29,188	59,953	22/ 2
New Modder ...	C236	15	78,000	40,555	90,445	20/ 2
Nourse Mines ...	180	5	40,200	11,794	*2,994	26/ 9
Robinson	215	6	43,700	10,203	2,274	18/ 6
Rose Deep	300	7	52,000	14,792	15,305	18/ 9
Village Main Rf.	130	4	18,800	5,648	1,515	23/ 8
Wolhuter	120	4	29,700	8,755	2,755	22/ 6
Village Deep ...	180	7	48,500	16,237	6,195	25/11
Tls. & averages	3,619	137	915,700	314,679	£287,003	22/ 9

A Includes 4 Nissen stamps. B Includes 24 Nissen stamps. C Includes 56 Nissen stamps.

* Loss.

Durban Roodepoort Deep, Ltd.—Loss due to the extreme shortage of native labour which continues to adversely affect the tonnage output.

General.—The published results do not include the increased price now being obtained under the new arrangement for the free disposal of the gold shipped since 25th July last. The gold so far sold is equal to about two months' output of the Witwatersrand and has realised a premium of approximately 16 per cent. Any increased profits obtained by the companies will be published quarterly after receipt of account sales.

Union Corporation.

Results of operations on the producing mines of this group for the month of October:—

Company	Stamps.	Tons Crushed.	Total Revenue.	Revenue per ton.
Geduld Proprietary	100	44,600	£68,106	30/ 6
Modder Deep Levels ...	70	44,400	98,336	44/ 4
Princess Estate ...	60	20,000	27,412	27/ 5
Totals	230	109,000	£193,854	—

Company.	Costs.		Profit.	
	Total.	Per Ton.	Total.	Per Ton
Geduld Proprietary ...	£46,238	20/ 9	£21,868	9/ 9
Modder Deep Levels ...	41,212	18/ 7	57,124	25/ 9
Princess Estate	28,779	28/ 9	*1,367	1/ 4
Totals	£116,229	—	£77,625	—

* Loss.

Note.—According to cable advice from London the gold so far realised under the new arrangement is equal to about two months' output, and the premium received is approximately 16 per cent. The above results do not take into account the increased price now being obtained.

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Albu Group.

The following information is supplied regarding the October operations of the producing mines of the General Mining group:—

Company	Tons Crushed.	Cost.	Cost per Ton.	Total Revenue.	Profit.
Aurora West ...	12,350	£16,292	26·38	£13,245	*£3,047
Meyer & Charl.	14,700	17,314	23·55	41,240	23,926
New Goch ...	14,400	14,191	19·71	13,847	*347
Roodepoort Un.	23,500	25,027	21·30	25,100	73
Van Ryn Est...	32,100	28,666	17·86	32,860	4,194
West Rand Cn.	32,000	37,120	23·20	38,988	1,868
	129,050	£138,613	21·48	£165,280	£30,061
				Less Losses	£3,394
					£26,667

* Loss.

The above results do not take into account the increased price now being obtained for gold, which, according to advices so far received from London, represents a premium of approximately 16 per cent. on the standard figure.

Roodepoort United.—An accident occurred to the shaft on October 29, which affected the output for the month to a small degree, and will affect the results for November to a larger extent. The damage will be repaired by Friday next.

Consolidated Mines Selection Group.

The following are the results of operations for the month of October, 1919:—

	Stamps Working.	Tons Milled.	Working Costs per Ton Milled	Value of Gold declared.	Yield per Ton.	Working Profit.	Working Profit per Ton.
Brakpan Mines	110	42,000	28/10·980	£78,876	37/ 6·722	£18,155	8/ 7·742
Springs Mines	80	39,600	27/11·484	77,044	38/10·935	21,689	10/11·451
Totals and averages ...	190	81,600	28/ 5·400	£155,920	38/ 2·588	£39,844	9/ 9·188

The published results do not include the increased price now being obtained under the new arrangement for disposal of the gold shipped since July 25 last. The gold so far sold has realised a premium of approximately 16 per cent. The increased profits obtained by the companies will be published quarterly after receipt of account sales.

Brakpan.—Taken from gold reserve, 1,000 fine ozs.; balance reserve at date, 5,724 fine ozs.

The operations for October were seriously affected by the shortage of native labour. Recruits are now coming forward more freely, and it is anticipated that the position will improve considerably during November.

The New Kleinfontein Co.

Appended are details of the operations on this company's property for the month of October: Stamps, 200; days, 30; tube mills, 4; tons milled, 51,000; gold recovered, 17,101 fine ozs.; net value, £71,823; profit, £2,991; working costs per ton (excluding development), £1 4s. 7d.; development to working costs per ton, 2s. 5d.; total working costs per ton, £1 7s.; capital expenditure, £1,506. The revenue includes further gold from the clean-up of the Apex reduction works. The above figures do not include the premium, approximately 15 per cent., now being obtained for gold. Adjustments will be published quarterly.

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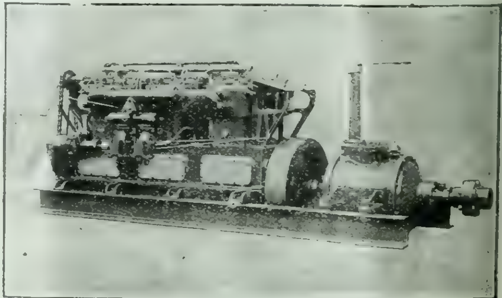

THE WEEK IN THE SHAREMARKET.

Slightly Lower Levels—Some Notable Improvements—Diamonds Active.

DEALINGS on the local market during the past week have been generally at slightly lower levels, although there have been a few notable improvements. The volume of business has been big, although very considerably less than was put through in the buoyant period of last month. London orders appear to have slackened off slightly, and this, combined with cable delays and further demands from mine workers for more pay and less work, have tended to depress stocks. The great strike in America, which may tend to stabilise the rate of exchange and so react on the gold premium, may also be a bear factor in so far as gold and diamond shares are concerned, although it should tend towards a "bullish" influence in regard to South African collieries. Although declines have been more frequent than advances the general state of the market is eminently sound, and latest London prices show that Kaffirs are listed at higher levels in Europe than they are locally. In an irregular market Anglo-Americans have probably been the leading feature. The shares have advanced sharply on the reported conclusion of a big deal in the South-West Diamond Fields. We understand that these shares are substantially higher in London than they are here. Sub Nigels have been better on news of striking the reef in the deep level shaft. Randfonteins have been strong around 26s. New Modders remain firm with limited transactions around £30. Modder Easts, which were dealt in at 34s. 3d. in London on Wednesday, remained steady at 33s.—33s. 3d. for the greater part of the week, but at the moment of writing show signs of sagging a little. East Rand Props by reason of improved profits are attracting notice around 8s. 6d., and the debentures are being enquired for at £67½. A new flotation in the African Oil Corporation, which owns extensive oil-bearing shale areas in the Wakkerstroom district, has come on the market and has engaged a great deal of attention. The shares, which are of 10s. nominal value, have been dealt in at 13s. 9d. In diamond stocks prices have been fairly firm. Frank Smiths have been the medium of extensive dealings around 7s.—7s. 3d. We understand that the meeting confirming the reconstruction scheme will take place early next week and the mine should be producing diamonds in the near future. New Elands have been an active market, but eased off on Thursday. Fluctuations for the week are as follows:—

	Fri., 31st.	Sat., 1st.	Mon., 3rd.	Tues., 4th.	Wed., 5th.	Thurs., 6th.
African Farms	15 3*	15 3*	15 6	15 9*	15 9	15 9*
Anglo-Amer. Corp.	49 0	54 6	54 0	52 6	53 6†	54 9
Apex Mines	7 6*	7 9†	7 6*	7 7*	7 7*	—
Aurora Wests	8 9†	—	9 0†	8 6†	8 6†	8 6†
Bantjes Cons.	3 1*	3 3*	3 3*	3 3*	3 1*	3 5*
Brakpan Mines	71 0*	71 0*	70 0*	71 0*	70 0*	69 0*
Breyten Colls.	10 0*	—	10 0*	10 0		10 0*
Bushveld Tins	2 9	2 6	2 7	2 8	2 6	2 6*
Cinderella Cons.	5 6*	5 6*	5 6*	6 3†	—	—
City and Subs.	7 6*	7 6*	8 0	7 6*	8 0†	8 0
City Deeps	58 6*	60 0*	63 0	60 0*	62 3	60 6*
Clydesdale Colls.	29 0	28 9*	28 9*	28 3*	28 9*	28 9*
Con. Langlaagtes	21 0*		22 0*	22 0*	22 0*	23 0*
Con. Main Reefs	11 6*	11 6*	11 9*	11 9	11 6*	11 9
Con. Mines Sel.	27 9†	—	29 0*	29 0*	29 0*	29 0*
Coronation Frees.	2 8	2 7*	2 7*	2 8	2 7	2 6*
Coronation Synd.	6 3*	6 3*	7 6	9 0*	10 0*	12 0*
Crown Diamonds	11 0	11 0	10 10½	10 3	10 0	10 3
Crown Mines	63 6	64 0*	65 0	66 6*	—	66 0
Daggafontein Mines	23 3*	23 6	23 3	23 6†	23 6A	22 3*
Do. Options (5yrs.)	7 6*	7 6*	7 6*	7 9*	7 6*	7 3*
East Rand Coals	2 10*	—	3 0	3 0	3 0	3 0*
East Rand Deeps	1 0*	1 1*	1 0*	1 0	1 0*	1 0*
East Rand Props	8 9	8 6*	8 0*	8 4*	8 9	8 6*
East Rand Debs.	£65*	£67	£67½*	£67½*	—	£67½*
Eastern Golds	1 6*	2 0†	1 6*	1 6	1 6*	1 9*
Frank Smith Dias.	7 3	7 3	7 3	7 1	7 0*	7 2
Geduld Props.	57 0*	57 6	60 0	59 3	59 9	59 6*
Glencoe Colls.	6 0*	6 0*	6 0*	7 6†		6 0*
Glynn's Lyden.	13 0*	16 6†	14 0*	14 6*	14 0*	14 0*
Govt. Areas	96 6	97 0	98 3	97 9	97 9*	97 0*
Jupiters	4 3*	4 3*	4 6*	4 6A	4 6*	4 6*
Klerksdorp Props.	2 0*	2 1*	2 0*	2 1*	—	—
Knight Centrals	6 6	6 4	6 4*	6 4*	6 4*	—
Lace Props.	22 6	22 9	22 3	22 6	22 6	22 9*
Leeuwpoort Tins	29 9	29 9*	30 9	32 0	31 3	30 9*
Lydenburg Farms	9 0*	9 0*	8 11*	8 9	8 9*	8 9*
Middelvlei Est.	2 6†	2 3	2 6†	2 6†	2 6†	—
Modder B.	179 0†	177 0	179 0	178 6	178 0	177 6*
Modder Deep	49 3	49 3*	49 3	49 9	50 0	50 0
Modder Easts	33 0	33 6	33 6	33 1½	33 3	33 0
Do. Options (3yrs.)	14 3	14 0	14 0*	14 0	13 9	13 6*
Do. Options (4yrs.)	16 0	16 0*	16 0*	16 3	15 9*	15 6*
Hume Pipes	23 0*	24 0	23 6	23 0*	24 0*	23 6
Natal Naviga. Col.	27 0*	—	27 3*	—	—	27 0*
National Banks	£15¼†	£15¼†	£15¼†	£15¼†	£15¼†	£15¼†
New Eland Dias.	75 0	67 6	67 0	65 0*	62 6*	60 0
New Era Cons.	11 9	11 3*	11 6*	11 3*	11 6*	11 6*
New Geduld Deeps	2 0*	—	2 0*	2 1	2 0*	2 0
New Heriots	9 9†	10 0†	8 6*	8 6*	8 0*	8 0*
New Kleinfonteins	12 0	12 9	12 6*	12 9	12 9	12 9
New Modder	—	£29⅜*	£29-19-6*	£29¼*	£29-18-6*	£30A
New Primrose	6 0†	6 0†	6 0†	6 0†	3 6	
New Unifieds	5 9†	—	5 9†	5 9†	5 9†	
Nigels	9 6†	8 9†	9 0†	7 6*	7 6*	7 6
Nourse Mines	13 6*	13 6*	14 0	14 0*	13 6*	15 0
Pretoria Cements	96 0*	97 0	97 0	97 0*	96 0*	97 0†
Princess Estates	2 6*	2 6*	2 6*	2 9	3 0†	2 7*
Rand Colls.	3 6*	—	3 6*	3 6*	3 6*	—
Rand Nucleus	2 0	2 0*	2 0*	2 0*	2 0†	2 0*
Rand Select. Corp.	85 0	86 0	87 6	89 6	89 6†	87 0*
Randfontein Deeps	5 9*	6 3*	6 6*	6 9	6 6*	6 6*
Randfontein Est.	24 4½	24 6	26 0	25 9	26 3	—
Roberts Victors	14 9A	16 6	19 0	—	16 0*	18 0†
Rooibergs	6 9	6 9	6 6*	6 6*	6 6*	6 6*
Roodepoort Uniteds	—	—	—	3 0*	3 0*	—
Shebas	2 6†	2 6†	2 6†	2 6†	2 0*	2 3
Simmer and Jacks	—	5 6*	6 0*	6 0*	—	—
Simmer Deeps	2 3*	2 3*	2 0*	2 3	2 3*	2 6*
S.A. Breweries	40 6*	40 0*	41 0†	41 0†	41 0†	41 0†
S.A. Lands	6 9*	6 9*	7 0	6 7*	6 6*	6 9*
Springs Mines	55 6	55 9	57 0	56 0*	56 0	56 0
Sub Nigels	21 0	20 6	20 6*	20 9	21 0	21 3
Swaziland Tins	20 0†	—	—	—	20 0†	19 0†
Trans. G.M.E.	—	17 0†	15 0*	—	17 0†	—
Van Ryn Deeps	86 0	87 0	87 0	88 3*	91 0	90 0
Village Deeps	—	15 6*	—	15 0*	15 6*	15 0*
Village Main Reefs	8 6†	—	8 9†	8 6†	—	9 0†
Vogel Deeps	3 9†	—	4 0†	2 6*	3 0	
Western Rand Est.	7 9	8 3	8 6	8 7½	8 6	8 4½
Witbank Colls.	—	67 6*	70 0*	70 0*	—	—
Wit. Deeps	10 0*	10 0*	10 0*	10 0*	—	10 0†
Wolhuters	4 2	3 6*	3 9*	3 9*	—	3 9
Zaaiplaats Tins	7 6*	7 8	7 7	7 7	7 7	7 6*
Union 5 p.c.	£105¼*	£102⅞	£102½	£102⅞*	£100¾	£103
New State Areas	32 9	32 6	33 3	33 0	33 0	32 6A
S. Van Ryns	9 0	8 10	8 9	8 9	8 7	8 3
S.A. Alkali	38 0	39 0	42 0	41 0	40 0	41 0
Tudors	1 9*	1 9*	1 9*	—		1 10†
Trans.-Delag. Inv.	80 0*	80 0*	80 0*	80 0*	80 0*	—
Tweefontein Colls.	25 6*	25 6*	25 6*	25 6*	26 0	25 6*
West Springs	26 7½	26 6	26 6	26 6	26 6*	26 6
West Options	10 3*	10 3*	10 7½	10 7½	10 3	10 0
S.A. Dia. Corp.	—	—	—	40 0*	—	—

*Buyers. †Sellers. AOdd lots. BEx London.

ANSWERS TO CORRESPONDENTS

All enquiries addressed to the Editor must bear the writer's name and full address. We cannot reply to enquiries by letter, but telegrams with replies prepaid will be answered. Correspondents are requested to write their names and pseudonyms distinctly.

"R. A. C. M." (East London). All highly speculative.

"Enquirer" (Salisbury).—We have looked into the matter, and find that the joint working scheme was submitted to the shareholders in both companies, and agreed to by them after full investigation.

"Holder" (Ophirton). (1) The mine may be reopened later on. Better wait. (2) Prospects should improve with the progress of the Far East Rand. (3) Purely a Rhodesian venture now and dormant at that.

"Speculator" (Likasi, Congo).—(1) (a) Three. (b) Eighteen months. (2) (a) Two. (b) Two years. (3) (a) One. (b) Two years. (4) (a) Two. (b) One on reef, other in two years. The options are to take up shares at 21s. 3d. and 22s. 6d. respectively in three and four years from flotation of the company.

ENGINEERING SECTION.

HAMMER DRILLS—THEIR HISTORY, DESIGN AND OPERATION.—IV

[By Henry S. Potter.]*

Position of Valve.—In most Jack Hammers the valve is arranged at about the mid-length of the cylinder and at one side. In some machines the valve chest is part of the cylinder and in others the valve chest is bolted thereto by studs and nuts; this latter design tends to make a more expensive construction in the first place, and also there is a tendency for the vibration of the machine to loosen the nuts holding the valve chest in place, and this causes leakage from one port to another, which tends in some cases to shorten the stroke of the piston. In some designs, such as the Sullivan and the new Climax Jack Hammer, the valve chest is arranged at the back of the machine. This design lengthens the machine and necessitates longer ports in the cylinder walls which sometimes form planes of weakness, which often result in longitudinal cracks.

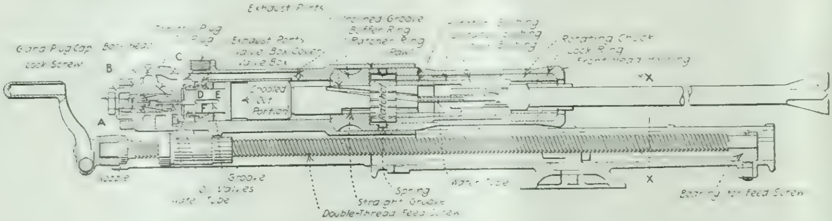

FIG. L.—SULLIVAN CRADLE HAMMER DRILLS.

Characteristics: Piston controlled by shell valve in back cylinder head: axial water feed: air cock on back head—same cock controls water supply to axial tube, air blast through tube for sludging holes; rotation arranged on front extension of piston similar to old style Siskol; chuck designed to take lug steel similar to Leyner, but the chuck is fitted with a locking device to hold steel in position. Smaller size machines made for hand operation, taking hexagonal and square shank steel.

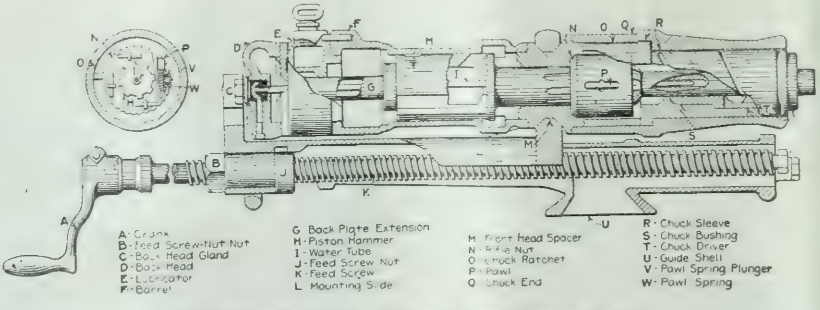

FIG. M.—DREADNOUGHT AND CLIPPER CRADLE HAMMER DRILLS.

Characteristics: Piston operates on semi-compound cycle similar to 16V Waugh (constant pressure in interior of piston). Piston held against rotation by means of keys engaging in longitudinal slots in piston head; rotation arranged at front end of piston; axial water feed.

The Dreadnought takes lug steel similar to Leyner.

The Clipper takes hexagon or square shank steel

Automatic oiler at rear of cylinder. Either machine can be adapted to be held in the hand.

Longitudinal Flutes on Piston.—Most machines operate with four or more flutes—if less than this number the bearing stresses on the face of the flutes raise a burr, thus tending to stop the machine.

The Rotational Flutes in Chuck.—In nearly all modern machines these are made solid with the chuck structure. In the early types these flutes were made in the form of a gun-metal casting, screwed into the chuck with a left-hand thread, but it was found that the flutes quickly wore off under torsional action of the piston.

Cycle of Operation.—The majority of the machines have a valve which only admits air to either end of the piston. The valve being moved on or off either seat by means of compression, and in some cases assisted by suction formed when the piston opens the exhaust port, the piston head forming the exhaust valve. This allows of a very simple structure and gives fairly positive action to the piston. After a time the power of the blow will fall off due to wear of piston in the cylinder, but I have found machines work satisfactorily with a difference between cylinder diameter and piston head diameter of eight to nine thousandths.

General Features of Modern Jack Hammers.—The machine should be of light weight and the shorter the overall length the better, as the operator has more command over the machine. A machine with few projections thereon is advantageous when it is mounted on a cradle, as projections make it difficult to change steels without moving the machine out of alignment with the hole. The air and water connections should preferably be arranged that they can be made on either side of the machine. If the connections are led on to the top of the machine, this affects not only the efficiency of the machine, but also shortens the life of the hoses. Rotation should be positive and synchronised with the blow and be arranged to rotate the steel when the piston is making its backward movement. If Jack Hammers are required to drill holes for ⅞in. dynamite, the finishing bit should not be larger than 1in.a cross, also if the starter is over 1⅞in. diameter the reaction is very considerable on the operator and puts a great strain on the rotation device. The air consumption is dependent, of course, on piston speeds, and if this is increased to too great a figure the result is high cost of upkeep and breakage of impact parts. Piston speeds should be designed with a view to *reasonable* drilling speeds. There have been several machines introduced on the Witwatersrand in which the pistons have been speeded up to what is apparently the absolute limit to what the materials will stand under working conditions, and also for *small diameter* steel to stand up to. That is why there has been considerable demand for polygonal section steels instead of cylindrical, as, of course, with a given diameter the polygonal section is stronger.

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*Paper read before the South African Institution of Engineers.

Shanks of Steel.—I beg to suggest that a definite decision with regard to the length and diameter of the shanks as used with air-feed, cradle and Jack Hammers should be come to either by the users or the manufacturers, and think that a 4¼in. instead of 3⅛in. or 3¼in. should be used especially for flat holes. At present on a light-weight Jack Hammer three different shanks are being used. See Slide 47. The general concensus of opinion is that the square is better than the hexagonal as the corners last much longer. The difficulty when making a square shank and collar on round steel is, especially with the high carbon steels which are now being used, that if the square is made too large a size it means considerable stress on the steel to make same. I therefore suggest to the users of Jack Hammers that it might be advantageous to use steel rolled to a *square* section, say, ¾in. or ⅞in. This would only necessitate the swelling up of an adequate collar on the steel, and probably forging down the corners of the steel so as to give clearance at the back of the cutting edge of the bit. (See Slide 47.) With reference to the collar used on steel for these machines, it has been found that this collar must be of adequate size, otherwise if the contact area between the collar and the face of the chuck is too small, the collar works very quickly into the face of the chuck, thus shortening the stroke of the piston. In most machines the dimension of the square on which the piston strikes, and the diameter of the collar are so proportioned that they both wear away equally, thus keeping the stroke of the piston fairly constant. With reference to the vibration felt by the operator when the machine is held in the hand, this vibration almost entirely comes back from the collar of the steel, being generally a factor of the distance the steel moves away from the machine when struck by the rapidly moving piston. Very little vibration comes from the inertia of the piston itself.

(To be continued.)

PERSONAL.

Messrs. Paul Dreyfus and W. P. Fisher sail for Europe this week on business.

* * * *

De Beers' annual meeting will be held on December 5 at Kimberley.

* * * *

Mr. Waldie Peirson has delayed his visit to England for business reasons.

* * * *

Mr. B. C. Bartley, of Messrs. Sykes & Co., Ltd., has returned to the Rand after some strenuous years at the Air Ministry.

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New Thor Diamond Mining Co., Ltd.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

Notice is hereby given that the Ninth Annual General Meeting of Shareholders in the New Thor Diamond Mining Company, Limited, will be held in the Board Room of the Company, No. 2, Cheapside, Kimberley, on Wednesday, the 3rd day of December, 1919, at four o'clock in the afternoon, for the following business :—

1. To receive and, if approved, to adopt the Directors' Report, together with the Balance Sheet and Statement of Profit and Loss Account, for the year ended 30th June, 1919.
2. To elect Directors in the place of the present Board, who retire in terms of the Articles of Association. Messrs. G. S. Ronaldson, J. van Praagh and N. F. Marcus, being eligible, offer themselves for re-election.
3. To appoint an Auditor for the ensuing year, and to fix the remuneration of Mr. F. J. Gardiner for the past year's audit.
4. To transact business that may be transacted at an Ordinary General Meeting.

Notice is also hereby given that at the same place and on the same day, immediately on the conclusion of the Annual General Meeting, an Extraordinary General Meeting of the Company will be held for the purpose of passing the subjoined resolution; and notice is hereby further given that the said resolution will be submitted for confirmation as a special resolution to a Second Extraordinary General Meeting of the Company, which will be held on the 22nd day of December, 1919, at four o'clock in the afternoon, in the Board Room of the Company, No. 2, Cheapside, Kimberley.

Resolution :

"That the agreement entered into in accordance with a resolution of the Board, dated 10th April, 1919, between the Company and the South African Diamond Corporation, Limited, dated at London on the 6th day of June, 1919, and at Kimberley on the 31st day of July, 1919, and which provides for an advance to the Company by the Corporation of an amount not exceeding £15,000; the purchase by the Corporation of 4,000 reserve shares of the Company at par; granting to the Corporation by the Company of options (1) to purchase at par the remaining reserve shares, and (2) to purchase the diamonds won by the Company, be and the same is hereby ratified and confirmed."

A copy of the said agreement may be seen at the Office of the Company, No. 2, Cheapside, Kimberley, or at the Office of the South African Diamond Corporation, Limited, Halton House, 20-23, Holborn, London, E.C.

By Order of the Board,

J. D. TYSON,

Secretary.

Kimberley,

1st November, 1919.

Blaauwbosch Diamonds, Ltd.

(Incorporated in the Orange Free State Province.)

NOTICE TO SHAREHOLDERS.

Notice is hereby given that the Tenth Annual General Meeting of Shareholders in the Blaauwbosch Diamonds, Limited, will be held in the Board Room of the Company, No. 2, Cheapside, Kimberley, on Wednesday, the 3rd day of December, 1919, at 3.30 o'clock in the afternoon, for the following business :—

1. To receive, and, if approved, to adopt the Reports of the Directors and Auditor, together with the Balance Sheet and Statement of Profit and Loss Account, for the year ended 30th June, 1919.
2. To elect two Directors, in the place of Messrs. G. S. Ronaldson and J. van Praagh, who retire in accordance with the provisions of the Articles of Association, but, being eligible, offer themselves for re-election.
3. To appoint an Auditor for the ensuing year, and to fix the remuneration of Mr. F. J. Gardiner for the past year's audit.
4. To transact any business that may be transacted at an Ordinary General Meeting.

By Order of the Board,

J. D. TYSON,

Secretary.

Kimberley,

1st November, 1919.

PNIELS, LIMITED.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

Notice is hereby given that the Sixth Annual General Meeting of Shareholders in Pniels, Limited, will be held in the Board Room of the Company, No. 2, Cheapside, Kimberley, on Wednesday, the 3rd day of December, 1919, at three o'clock in the afternoon, for the following business :—

1. To receive, and, if approved, to adopt the Reports of the Directors and Auditor, together with the Balance Sheet and Statement of Profit and Loss Account, for the year ended 30th June, 1919.
2. To appoint three Directors in the place of Messrs. Ronaldson and J. van Praagh, who retire in accordance with the provisions of the Articles of Association, but, being eligible, offer themselves for re-election.
3. To appoint an Auditor for the ensuing year, and to fix the remuneration of Mr. F. J. Gardiner for the past year's audit.
4. To transact any business that may be transacted at an Ordinary General Meeting.

By Order of the Board,

J. D. TYSON,

Secretary.

Kimberley,

1st November, 1919.

THE NATIONAL BANK OF SOUTH AFRICA, LTD.

INTERIM DIVIDEND.

NOTICE IS HEREBY GIVEN that an Interim Dividend at the rate of Seven per cent. per annum has been declared for the half--year ended 30th September, 1919, being seven shillings per share.

The Dividend will be payable on 2nd December to all Shareholders registered in the Books of the Company at the close of business on Saturday, 22nd November, 1919, and to holders of Coupon 42 attached to Share Warrants to Bearer.

The Transfer Books will be closed from 24th to 29th November, 1919 (both days inclusive).

Dividend Warrants will be despatched to South African Registered Shareholders from Pretoria, and to European Shareholders from London Office on or about 2nd December.

Holders of Share Warrants to Bearer are informed that Coupons may be deposited at any of the Bank's Branches, and will, upon verification by Head Office, be paid on or after 2nd December, 1919.

By Order of the Board of Directors,

C. P. MATHEWS, Secretary.

Pretoria, 5th November, 1919.

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TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Effect of Increased Railway Rates and American Coal Strike on Local Business—Paints, Oil and Varnishes—Timber and Building Materials—Electrical Goods—The Hume Pipe Industry—Iron, Steel and Machinery—Second-hand Material and Machinery—Stray Notes.

MERCHANTS connected with the mining material business are excited in consequence of the increase in railway rates on all classes of goods to plus 25 per cent. instead of 10 per cent., which latter was arranged during the war period, and now another 15 per cent. has been added to that. There is also great interest taken in the coal strike in America, where an enormous number of people are concerned. The railway advance has dislocated things, and as the increase only took place on 1st November there has not been sufficient time to see how this will affect prices, because someone has to pay the 15 per cent. advance. It does not seem overmuch for small consignments, but for heavy goods, such as iron and steel required by the mines, the aggregate is no small amount. For example, the new rate means only about a farthing per foot on deals, but when 10,000 ft. are concerned this is just over £10. A merchant sold a line on October 30th and a repeat was ordered on Wednesday, but the seller asked for the extra railway charges. The buyer could not see eye to eye with the seller, and words arose in consequence. The buyer contended that there was plenty of the same old stock and therefore it was not fair to charge the extra railway rate. The seller was, however, adamant on the assumption that it would cost him extra railway carriage when the stock was replaced. The second-hand people seem more confused than the ordinary merchants, because holders consider they are entitled to more, whereas would-be buyers say in very few cases do the second-hand men pay railway charges, but obtain the goods locally. The fear entertained of the strike is the more disturbing element of the two, and obviously it will take a little time to see how the strike in America will eventuate. Already the American importers will not make any guaranteed quotations, in fact they are ill at ease as to what to do during the next few days. In consequence of the strike and the increased railway rates all prices in the material line are strengthening, but actual quotations at the moment are difficult to gauge. The son of a merchant, who recently went to America, has just sent a letter saying that his personal experience is altogether different from his preconceived notions, as he thought the Press had been much exaggerating. He now recognised on the spot that the strike fever is much worse than he ever dreamed of, because strikes are arranged overnight for the next morning, thus upsetting the best of calculations; therefore he will be glad to be back in Johannesburg again.

PAINTS, OILS AND VARNISHES.

According to a trade circular issued for November, the turpentine market is strong and active at 110s. for 2-4's and 120s. for 10-1's, which is higher than our previous quotations, yet this is below the landed cost into Johannesburg, which represents 128s. per case to-day. Linseed oil is 105s. raw, 110s. boiled. White lead, 95s. per 100 lbs., 1s. 3d. per lb. for small quantities, and 1s. per lb. for medium-sized lots; alum, 7d. per lb.; beeswax, 2s.; brown paper, finest quality, about 60 lbs. to a ream, 9½d. per lb.; caustic soda, in 40 lb. tins, 7½d. per lb.; chamois leathers, best quality skins, 9s. 6d. each; Hall's distemper, 14 lb. tins, 14s.; Muralo, 7 lb. packet, 4s. 6d.; calcite, 7 lb. packet, 5s.; glue, town 1s., cabinet 1s. 4d., Scotch 1s. 8d., Russian 2s. per lb.; gold leaf, best English, 1s. 6d. a plain book, transfer 5s.; ready mixed paints, 1 lb. to 14 lb. tins, 1s. 6d. per lb.; 70 lb. drums, 1s. 3d.; plaster of Paris, 6d. per lb. packet; pumice powder, 9d. per lb. packet; putty, finest English, 7½d. per lb., and 9d. per lb in bladders; resin, 9d. per lb.; shellack, best orange 5s. 6d. a lb., and white 8s. 6d. per lb.; size, concentrated, 2s. 3d. per lb.; stains, flat liquid, 20s. per gall; varnish, 25s. per gall.; waxes, paraffin 1s. 6d. per lb.; sealing wax in blocks, 9d. per lb.; castor oil, 110s. 2-4's, second quality 95s.; best American salad oil, 145s. 2-4's; South American, 125s.; and South African, 100s.; olive oil, 30s. to 35s. Spanish and Portuguese; the French variety is expected shortly; grease, imported, £45 per ton; and locally-made, £27 10s. to £32 per ton. Plate glass is getting very scarce indeed and some orders cannot be executed in consequence. Mirror is 8s. per ft.; window, 21 oz., 2s.; and 16 oz., 1s. 6d. per ft. Business in painting and in the demand for plate glass, as well as window glass, is excellent.

TIMBER AND BUILDING MATERIALS.

All timbers are very scarce in Johannesburg. The European demand on the Baltic has checked arrivals in South Africa, which are usually due in September and October, but on this occasion October-November will be nearer the mark. The coast houses are said to be keeping

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PORTO RICO—San Juan, Mayaguez and Ponce. COSTA RICA—San José.
DOMINICAN REPUBLIC—S. Domingo, Puerto Plata, Sanchez, S. Pedro de Macoris and Santiago de los Caballeros.
MARTINIQUE—Fort de France.
GUADELOUPE—Pointe à-Pitre and Basse Terre.
VENEZUELA—Caracas, Ciudad Bolivar, Maracaibo and Puerto Cabello.
BRITISH WEST INDIES.
Antigua—St. John's. Bahamas—Nassau.
Barbados—Bridgetown and Speightstown. Dominica—Roseau
Grenada—St. George's. Jamaica—Kingston. Montserrat—Plymouth.
Nevis—Charlestown. St. Kitts—Basseterre. Tobago—Scarborough.
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timber stocks back to supply their own wants, which are heavy. The price of deals is 1s. 8d. to 1s. 9d.; flooring, 9d.; and ceilings 6¼d. to 6½d. The quotations from the Baltic are not over-reliable, because what often happens is that a hundred standard line is ordered from here and only from 10 to 30 standards are sent. Another tendency is to quote for odd lots and by the time the cables get back to Europe many of the lines have been sold. Rangoon teak has advanced from 24s. to 27s. 6d. a cube, and Japanese oak from 1s. 7d. to 1s. 9d.; galvanised iron is reckoned to be from 1s. 5d. to 1s. 6d. a foot, whereas a second-hand yard is selling 24-gauge at 1s. 6d. a foot very readily indeed. Business throughout the building trade is buoyant, with any number of new contracts ready to come out. Good artisans are scarce for bench and cabinet work, especially now that imported doors, windows, casements and such like have to be made here, particularly now the architects are putting nicer work into the shops, offices and the better class of residences. The best cabinet and furniture makers are also scarce as the Johannesburg factories are making much fine and artistic work, therefore obviously require the more expert workmen.

Second-hand Timber and Iron.

Roofing iron, which has previously been mentioned in these notes as being very scarce of late, is now at long last starting to come in, and it is generally expected that within the next few days the market will be fairly supplied; indeed some firms have already received good consignments. The ruling price of iron (new) is 1s. 6d.; of second-hand stock there is practically none in town. Timber remains very scarce and is fetching for new 1s. 8d., and second-hand 1s. 3d. Orders have been plentiful for some time back, and there is now every prospect of satisfactory business being done in the various second-hand yards, after having experienced a very slack time indeed, on account of absence of materials, for months past.

Electrical Goods.

Synchronising with the breaking up of the drought the tubing scarcity, which had made itself acutely felt during the past few weeks was relieved by the arrival of considerable consignments within the last seven days, and it is estimated that with the tubing now on hand, together with shipments shortly expected, electrical dealers' wants in this respect will be satisfied till about next March. One prominent dealer recently received upwards of four tons of cauldron brass tubing, which is, of course, much too expensive to put into walls, but in the absence of the ordinary tubing it has to be used for that purpose. Other materials are coming in fairly freely, but it is stated that there are no ceiling roses in the country. These, which cost in pre-War days 2s. 6d. a dozen, are now selling at 15s., having risen from 6s. a dozen within a week. Our informant stated that the scarcity in this article is likely to last for some considerable time, and will be the means of giving our Japanese friends a chance to cut into our market. As illustrating the way in which an article may move in these days when it is in demand and at the same time scarce, a well-known dealer mentioned that he had recently on hand a few gross of low tension ceiling roses, which had originally cost him 25s. a gross, but which, on account of their having become almost obsolete he had written off in his profit and loss account. Owing to the present dearth of these articles he had quite recently disposed of these at 75s. a gross, and had indeed been offered considerably more, which he had declined. Lamps still remain at the prices ruling recently, but other materials have a firming tendency. Orders for both town and country are quite satisfactory.

The Hume Pipe Industry.

Arrangements, we understand, are being made for the handling of Hume concrete ventilating pipes for mining purposes with Messrs. Fisher's Inventions, Ltd. The Hume Pipe Company have been successful in securing some large contracts for pipes during the past few weeks. Extensive orders have been received from Grahamstown, Hermanus, Port Elizabeth, Uitenhage, Montague, Natal Collieries, Norval's Pont, etc. In spite of the fact that the production of pipes has increased from 25 tons to nearly 200 tons per week, it has been found necessary to put on extra shifts to enable the orders in hand to be completed. Large orders are being received for tanks, silos, etc. As the drought has brought home to agriculturists the great importance of silos and more silos, the Hume Pipe Company should have a grand opening in manufacturing round silos, which are the best because these obviate the crevices and corners in the square ones. Air tight silos are absolutely necessary, otherwise the fodder contents go mouldy and even rotten.

Iron, Steel and Machinery.

There is still a big demand for ploughs and agricultural machinery. This is an excellent sign that the farmers are still well-to-do, notwithstanding the long drought. This, however, is not surprising as the price of wool has never been so high and the mealies are a good second in that respect, to say nothing of the fabulous prices obtained for forage. The bar iron and steel merchants continue exceedingly busy. The railway rates have not yet altered prices, chiefly because the Dunswart and Vereeniging factories are keeping values well in check, although some institutions indent for imported iron. The Transvaal article is really well patronised for all ordinary work and in future importers must reckon accordingly, which also is an indicator for the great future of the South African steel and iron industry after its inevitable initial difficulties. Vereeniging mild steel is 33s. 6d. for large and 35s. per 100 lbs. for the smaller sizes. Imported rounds, 37s. to 42s., and small flats 37s. 6d., and large flats 35s. per 100 lbs. New black 2 in. iron pipes have been sold at 1s. 2½d. and second-hand 1s. 1d. per foot. Brass rods and plates are 2s. 6d. per lb. Imported mild steel, 4¼d. per lb.; drill steel, 7½d. per lb.; and tool steel about 1s. 3d. A merchant states that tool steel costs in England about the price it is sold at in Johannesburg. Shovels are from 57s. 6d. to 60s. per dozen. Quotations are most difficult to obtain on account of the uncertainty about the American strike. As a general statement prices have fractionally advanced to cover the extra 15 per cent. increase in the railway rates.

Second-hand Material and Machinery.

Prices: Anvils, 9d. per lb.; cam shafts, £20 each; battery heads, 60s. to 70s.; stems with tappets, £10 each; shoes, 45s. per 100 lbs.; belting, single leather, 9d. and 1s. per ft.; double, 7s. 6d. to 10s.; rubber belting, 4s. 9d. to 5s. 6d. per ft.; Balata best English, new, 4½ in. x 6-ply, 2s. 2d. per ft.; 10 in. x 6-ply, 5s. 6d.; 18 in. x 8-ply, 12s. 7d. per ft. Blocks, single-sheave, 15s. to 25s. each.; Blockwood pulleys, 5s. to 10s. each; chain blocks, £12½ to £15; copper plates, 2s. per lb.; crowbars, 7d. per lb.; drill sharpeners, £50; sledge hammers, 6d. per lb.; rails (tramway), 35, 45, 60 and 80 lbs., £22½ per ton; trucks, side tip, 18 in. gauge, £15 to £17 each; fish plates, 4d. per lb.; windmills, £50 to £60; circular saws, £7½ to £10½ each.

Stray Notes.

An iron building was valued at £225 for breaking-up purposes, but when submitted to auction it realised £320. Second-hand roofing iron, not too good, went at 1s. 2d. per ft. under the hammer. The auctioneer says that better prices could often be obtained if the owners would see that more care was exercised in taking down the iron, as it is needlessly damaged by the unfair use of crowbars and claw hammers. All second-hand building materials in good condition generally fetch excellent prices under keen competition. Carpenters' tools are much in demand at big values. Clyburn spanners unbranded are not good wearers. The property market continues excellent, which is only natural as wages cannot come down with the high cost of living and the organisation of trades unionism. Farms are in great demand; a leading auctioneer was heard to remark that sellers had become too greedy, thus checking sales. The unearned increment tax may be cancelled, because evidently when passed by the (farmers) Provincial Council they did not understand that it affected farms as well as houses.

THE
S.A. Mining
AND
Engineering Journal

WITH WHICH IS INCORPORATED
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Notes and News.

New Van Ryn Mines and Estates, Ltd.

We are advised that at the New Van Ryn Mines and Estates, Ltd., drilling operations are being vigorously carried on and the outlook is most promising.

* * * *

Armistice Syndicate.

Drilling operations commenced on the property of the Armistice Syndicate, situated to the south of Roodepoort, on Thursday. A lengthy article on the properties of this syndicate appeared in our issue of July 26th last, and we hope to publish the results of boring in the near future.

* * * *

Spencer Bay Diamond Company.

The secretary of the Spencer Bay Diamond Mining Company states that a manager has been appointed for the company. The necessary plant is being built, and operations are expected to commence in about six weeks' time.

* * * *

Deep Water Diamonds.

The secretary of the Deep Water Diamonds, Ltd., writes: "The engineer wires to-day that the whole plant is ready to haul gravel on receipt of acid for the electric batteries. This acid has been delayed on rail, and is expected to arrive at Christiana at any moment. The signalling apparatus cannot be worked without the electric battery."

* * * *

Bonus for Diamond Company's Employees.

In view of the improved condition of the diamond market, the directors of the New Jagersfontein Diamond Mining Company have decided to grant each employee a bonus on the pay-day before Christmas, based on the period of past services, ranging from five years and upwards down to six months. The total amount involved exceeds £10,000.

* * * *

Zaaiplaats Tin.

The Zaaiplaats results for the month of October, 1919, were as follows: Concentrates won, 13 tons; estimated loss for the month, excluding Government taxes and directors' fees, £1,031; capital expenditure, £175. The concentrating plant ran 27 days on accumulated product. Crushing was suspended after 16½ hours' work had been done, with the object of reducing costs of treatment by accumulating rock and only running the stamps when sufficient ore had been accumulated to ensure a steady run.

* * * *

Aviation.

A Press communique, dated Simla, 30th September, 1919, issued by the Government of India in the Department of Commerce and Industry, says: The subject of civil aviation is now dealt with by the Commerce and Industry Department of the Government of India. Mr. A. H. Parker, I.C.S., who served in the Royal Air Force during the War, has been placed on special duty in that Department to deal with questions connected with the subject. It has been decided to constitute an Air Board as a body advisory to the Honourable Member in charge of the Department. The Board will consist of the following members: The Secretary in the Commerce and Industry Department, the Director General of Posts and Telegraphs, the General Officer Commanding the Royal Air Force, General Wigram of the General Staff Branch, Headquarters, the Financial Adviser, Military Finance, and Mr. Parker as Secretary to the Board. Communications on the subject of civil aviation should be addressed to the Secretary, Air Board, Commerce and Industry Department.

* * * *

The October Output.

The gold production of the Transvaal last month totalled 723,722 ozs., being an increase of 25,164 ozs. compared with the shorter month of September, and an increase of 43,958 ozs. over the output for October, 1918. The totals as announced by the Chamber of Mines this week are as follow: Witwatersrand: October, 705,313 ozs., value £2,995,979; September, 680,359 ozs., value £2,889,980; increase, 24,954 ozs., value £105,999. Outside districts: October, 18,409 ozs., value £78,195; September, 18,199 ozs., value £77,307; increase, 210 ozs., value £888. Grand total: October, 723,722 ozs., value £3,074,174; September, 698,558 ozs., value £2,967,289; increase, 25,164 ozs., value £106,887. The values mentioned do not include the increased price now being obtained under the new arrangement for the free disposal of gold. A premium of approximately 16 per cent. has been realised on gold shipped since July 25. The following increases are shown by Rand companies: New Modderfontein, £18,699; Government Areas, £16,086; E.R.P.M., £10,755; Modderfontein B., £6,856; Village Deep, £6,532; New Kleinfontein, £6,308; Knight Central, £5,956; Springs Mines, £5,560; Robinson Deep, £4,248. The principal decreases are: Knights Deep, £4,936; Simmer and Jack, £4,906; Ferreira Deep, £2,604. The following are the official figures regarding the stamp position: October, Rand 7,924, Outside 290, total 8,214; September, Rand 7,899, Outside 285, total 8,184; increase, Rand 25, Outside 5, total 30. The native labour figures for the past three months are as follow: On gold mines, August 170,844, September 169,120, October 167,499; on coal mines, August 12,450, September 12,392, October 12,691; on diamond mines, August 5,655, September 5,294, October 4,492; total, August 188,949, September 186,806, October 184,682.

* * * *

Land Settlement Lecture by Mr. Kanthack.

At the request of the Oversea Settlement Committee, a lecture on "Land Settlement Conditions in the Union of South Africa" was given by Mr. F. E. Kanthack, Director of Irrigation for the Union of South Africa, at Central Hall, Westminster, recently, Lieut.-Col. Amery, Parliamentary Under-Secretary for the Colonies, presiding. The lecturer advised settlers to go to South Africa with an open mind and an unpledged bank balance, and if they lacked experience to apprentice themselves to a farmer or take advantage of one of the excellent agricultural schools. Afterwards they might take up farming with prospects of success. With reference to citrus fruit farming, the present propaganda carried on by those anxious to sell land gave an exaggerated view of the possible profits. He advocated cattle rearing as the main interest of South Africa, declaring that it afforded a far more reliable source of wealth than gold mining. The future of South Africa largely depended upon the scientific development of the great livestock industry, but co-operation between stock farming and agriculture was essential. The veld as a pasturage for livestock was not to be surpassed. Pedigree cows and bulls formed the top notch of cattle farming, and as much as £2,000 each was freely paid for them. His advice to settlers was to avoid fancy farming and stick to foodstuffs, which were always in demand. It would be well for South Africa if there were no further booms in ostrich feathers, as they were responsible for inflating the price of land and keeping farmers from practical farming. With regard to cattle, the settler could choose a 50 or 100 square mile farm in the Kalahari Desert or a small farm in the Transvaal. Whichever he selected the cattle would prove of very high quality. The Government was prepared to assist the settler by leasing land on easy terms and by giving financial assistance. On the South African railways farmers' produce and their needful imports were carried at a low rate. Settlers had the benefit of one of the most highly equipped veterinary services in the world, and would be assisted in every department at a low rate or without payment. In order to buy Government land it was necessary for the purchaser to be in South Africa, for which the lecturer in conclusion predicted a great and prosperous future.

* * * *

Frank Smith Diamond Reconstruction.

Frank Smith Diamonds have engaged a great deal of attention locally during the past few months on account of the impending reconstruction scheme and the re-opening of the mine. It will therefore be of interest to refer to the report of the directors for the year ended June 30th, 1919, presented to shareholders at the annual meeting held in London on October 23. In the course of this report it is stated that expenditure during the year, after deducting sundry revenue, has amounted to £4,445 10s. 10d. Thanks to the financial assistance rendered to the company by the Johannesburg Consolidated Investment Company, Ltd., it has been possible during the period of the war to maintain the company's properties, to provide for the caretaking of the buildings and plant, and to avert the liquidation of the company. The question of raising funds to discharge the liabilities of the company and to provide working capital for resuming work at the mine has occupied the directors' close attention. As the result of negotiations initiated by the South African directors of the company, a scheme of reorganisation has been proposed from South Africa, which is supported by South African shareholders representing a large shareholding. The proposal which is recommended for adoption is expressed in the following resolutions: (1) That the capital of the company be reduced from £300,000 divided into 800,000 shares of 7s. 6d. each to £199,078 2s. 6d. divided into 538,250 shares of 3s. 9d. each and 261,750 shares of 7s. 6d. each, and that such reduction be effected by cancelling capital which has been lost or is unrepresented by available assets to the extent of 3s. 9d. in respect of each of the 538,250 shares of the company which have been issued and by reducing the nominal amount of each of such 538,250 shares from 7s. 6d. to 3s. 9d. (2) That on the reduction of the capital of the company to £199,078 2s. 6d. taking effect every two of the 538,250 shares of the company of 3s. 9d. each resulting from such reduction which have been issued and are fully paid be consolidated into one share of 7s. 6d. so that the capital of the company may consist of 530,875 shares of 7s. 6d. each. (3) That on such reduction of capital taking effect the capital of the company be increased to £300,000 by the creation of 269,125 new shares of 7s. 6d. each ranking in all respects *pari passu* with the the above-mentioned 530,875 shares of 7s. 6d. each. The effect of this scheme will be that each shareholder will hold one share of 7s. 6d. each in place of every two shares at present held by him, and will further be entitled to subscribe at par for an additional share of 7s. 6d. in the re-organised capital of the company in respect of every two shares held by him at present. The issue of 269,125 shares at 7s. 6d. will provide a sum of £100,921 17s. 6d., and after discharging the liabilities of the company, amounting to about £40,000, there will be available a sum of about £60,000 for working capital. The subscription of the 269,125 shares has been guaranteed by the Johannesburg Consolidated Investment Company, Ltd., of Johannesburg, on behalf of themselves and sub-underwriters. The guarantors will have the right for a period of three years after allotment to subscribe at par for the 261,750 reserve shares of the company. Seeing that a considerable part of the company's capital is held by shareholders resident in South Africa, and that under the guarantee of the new issue the proportion of shares held in South Africa will increase further, a stipulation has been made by the South African guarantors that the company shall either be registered in South Africa—like most diamond and gold mines owning properties in South Africa—or that the management and direction of the company shall be transferred from London to South Africa. Acting on legal advice the Board proposes that the second alternative should be adopted, and this is a condition of the guarantee. The company will thus be very much in the position of a company registered within the Union of South Africa. To carry out this change certain alterations are required in the articles of association. They are set out in detail in the notice accompanying the report. An extraordinary general meeting as per accompanying notice was held following the ordinary general meeting of the company, and the resolutions, passed by the requisite majority, were submitted for confirmation at a further extraordinary general meeting which was held on Monday, the 10th November, 1919. The reduction of capital will require the consent of the court. The capital issue department of His Majesty's Treasury has been consulted and has consented to the above issue being made.

The Sheba Reconstruction.

The following is the proposal to be considered at a meeting to be held in London on the 8th December, as issued to shareholders of the present Sheba Company, by the directors. At the last annual meeting the chairman stated that immediately the board considered it advisable a scheme for raising money for the purpose of development on the lines recommended by the company's consulting engineer would be prepared and submitted for the approval of the shareholders. The board has given the matter the most careful consideration and has decided that in order to raise the amount required it will be necessary to reconstruct the company and (subject to the sanction of the shareholders) it is proposed to carry out the reconstruction upon the following lines: (1) A new company to be formed with a capital of £300,000, divided into 1,200,000 shares of 5s. each to acquire the assets and undertaking and take over the liabilities of the present company. (2) The new company to issue as consideration for the purchase 1,084,954 shares of 5s. each with 4s. per share credited as paid and having a liability of 1s. per share payable as to threepence per share on application, threepence per share on allotment, and sixpence per share six months after allotment. These shares to be offered to the existing shareholders share for share in accordance with their holding. (3) The new company to undertake to discharge out of the amount received in respect of the above assessment all the existing debts and obligations of the present company. Under the above scheme it is estimated that the new company will commence business with a cash working capital of about £50,000. It is felt that to ensure success of the scheme the subscription of the whole of the 1,084,954 shares in the new company must be underwritten and this has accordingly been arranged at 5 per cent. upon the liability of 1s. per share. Licence has been duly granted to proceed with the issue.

* * * *

Sir William Hoy on the Low-Grade Mines.

Before the Low-Grade Mines Commission this week, Mr. J. R. Fulton, who represented Sir Wm. Hoy, submitted a statement drawn up by the latter in connection with the relationship between the railways and the low-grade mines. Dealing with the point that coal freights were such that a considerable profit was made on the traffic, constituting a tax on gold mines, Sir William stated that, according to the Act of Union, rates and fares charged had to balance working expenses after making allowances for renewals and interest on capital. For the year ended March 31, there was a loss of £1,044,747, and after deducting a profit on the harbours of £57,080, there was loss of £987,667. For the current year (ending March, 1920) there was an estimated loss of £82,500. The loss to the end of September (six months of the year) was £311,000. There was no reason to expect improved results and the Administration was faced with the necessity of further increasing rates. Coal was one of the lowest rated commodities carried over the S.A.R. Under pre-war conditions, coal traffic was regarded as profitable; under present conditions it was doubtful whether an appreciable profit was now being made on coal for local consumption. Sir Wm. Hoy gave figures showing certain mines as making a profit not exceeding 1s. per ton milled or actual losses during the first half of 1919, and he showed that the quantity of coal supplied to those mines by the Transvaal Coal Owners' Association during the period was 256,536 tons, on which the estimated railage was £67,700 - an average rate of 5s. 3·344d. per ton. Coal required to mill one ton of ore was 0·0823 tons, and the railage thereon would be 5·213d., which was equal to slightly more than one half of the actual loss per ton milled. So that had the coal been carried free, the mines would still have been left with a loss of £64,050, and if Mr. Roy's suggestion that the rate be reduced to ½d. per ton per mile were accepted, the loss to the mines would still have been £106,806. After giving further facts and figures in connection with the rates on coal, Sir William said that the remedy for the low-grade mines would not appear to lie in any reduction in the railway rates, but in some other direction either by direct grant from the Government or remission of taxation.

TOPICS OF THE WEEK.

TWO MINUTES PAUSE ON THE MINES.

Just over a year ago the guns ceased fire after more than four years of incessant and terrible warfare and the whole world heaved a vast sigh of relief. During the past week the day of the great deliverance has been marked throughout the British Dominions by a two minutes' pause. On Tuesday at the eleventh hour of the eleventh day of the eleventh month there was, in response to the wishes of His Majesty, a cessation of effort and energy throughout Greater Britain. People paused in their labours and the wheels of industry were completely idle for two minutes, which were consecrated to the memory of the great dead and to thankfulness for the return of peace. In Johannesburg people stood bareheaded in the streets and work and noise ceased. Trams and vehicles stood still and even the telegraph machines and operators were idle. Along the Reef the mills ceased grinding out their gold, hoisting operations were suspended, and for one hundred and twenty seconds there was complete cessation of industry. It is hardly necessary to say that no body begrudged giving two minutes of complete silence to the commemoration of the great peace which fell upon the world a year ago. But from the point of view of mere mathematics it is interesting to reflect on the cost of those two minutes of silence to the gold mining industry. How much did the Rand lose between 11 a.m. and 11.2 a.m. on Tuesday? The present rate of gold production on the Rand is approximately £120,417 per day, or £5,017 per hour. This figures out at £82 10s. per minute, and on this basis the apparent loss would be £165. As a matter of fact the loss was very much greater than this. In the first place the above figures do not take into account the increased premium now being obtained for gold. Then again the two minutes were in point of fact more than two minutes, for engines had to slow down and then restart, so that in all probability a net loss of at least three minutes was sustained. These two factors, the gold premium and slowing down so as not to encroach on the two sacred minutes would, if applied to the calculation, bring the loss up to over £280. Even then we are still far short of the correct answer to this problem for the reason that the amount so lost will not be recovered until the mines concerned come to the ends of their lives. Theoretically each mine should have a life two or three minutes longer than it would have had but for the armistice day observance, and in those final minutes each mine will recover what it lost on November 11th, 1919. In order then to arrive at a correct answer to this question one would have to calculate the deferred value of the apparent loss on the basis of compound interest deducted over the average life of the productive Rand. We must confess that such a problem rather appals us, but as a study in values it has its fascination which may appeal to mathematicians who are richly endowed with both logarithmic tendencies and spare time.

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ACTIVITY IN DIAMOND STOCKS.

Further Facts About the Big Anglo-American Deal—The Syndicate Craze—Numerous Debutantes and Revivals—News from the Properties—Anticipations Outshine Achievements.

In the absence of booming orders for the big gold and diamond stocks from oversea the local market has taken kindly to diamond syndicates again. No doubt interest has been infused into this section of the "Kaffir Circus" by reason of the big deal brought off in Holland by Mr. H. C. Hull whereby several important gem-bearing areas in the South-West African Protectorate which were formerly owned by Germans have become the property of the Anglo-American Corporation and kindred interests. The United States has purchased diamonds from South Africa in immense quantities during the past twenty years and it is significant but not in the least degree surprising that New York has at last actively identified itself with the diamond producing as well as the diamond buying business.

Further Particulars Awaited.

As was stated in our last issue, a company with a nominal capital of three and a half millions sterling styled the "Consolidated Diamond Mines of South-West Africa, Ltd.," has been formed in Capetown to acquire and work the German companies, and the Government has given its consent to the deal generally. Details of the purchase terms are not available on this side, and there is a feeling in certain quarters that some opposition will be shown to the scheme. Inasmuch as the Anglo-American people have dealt direct with private companies it is, however, somewhat difficult to understand the grounds on which objection is based. The outstanding fact is clear that these companies which formerly were owned by Berlin will now be controlled by the Union. Nothing is known here as to what policy the company will pursue in regard to production, although it naturally is assumed that the Consolidated Diamond Mines Company will in conjunction with other producers have to consider the laws of supply and demand which determine the price of a luxury commodity. For diamonds, despite the present buoyancy of demand, are after all at the caprice of fortune and fashion, and if in addition to a vigorous policy of output by the Consolidated Diamond Mines all the syndicates which are now rumoured to be turning out trumps fulfil half the expectations of those interested, well then in those events there will obviously have to be some restraining check put on the output. The safety valve of the situation of course lies in the fact that all the diamond syndicates which are now engaging so much attention will not fulfil expectations. We shall indeed be very much surprised if half of them prove anything approaching successes. We have seen diamond boomlets before.

South-Wests, Deep Waters and Therons.

Nevertheless diamond syndicates are very much in the limelight just at present. New names are constantly appearing under the "unlisted heading," and old concerns are being revived, whilst other projects only recently in great favour are now seldom mentioned. South-West Diamonds, for instance, have evinced no life or interest, despite the Hull-Oppenheimer deal, which might be said to impinge on their land areas. It is understood that the South-West Company has recently recovered one or two very nice parcels of stones and also that a gentleman closely connected with the company has gone to England with a view to securing capital for this venture. South-Wests, however, are not particularly active at present, and Koodoo Diamonds have not been mentioned on change for some time. Deep Water Diamonds are spoken of as one of the type of lose-all or make-everything variety. The prospect of finding a rich concentrate of diamonds in the bed of the Vaal River is certainly captivating, and as it is announced that the diving bell is about to be utilised the operations of this syndicate will be awaited with interest.

At the Theron Diamond property, in which Sir Abe Bailey is largely interested, a much-needed water supply has been secured. Washing is now proceeding with one pan, and it is expected that operations will be extended in the near future. Invictas, Erfblooms, Spencer Bays and Steinies are all greatly favoured in their respective quarters, and Monteleo Syndicate shares have been in considerable demand on news of the finding of one or two stones of good size and splendid quality. The diamond syndicate craze is at least likely to last until there is renewed activity in the gold market and attention is again diverted to the alluring prospects of selling gold at a premium.

Glynn's Lydenburg.

The following are the particulars of the output of the Glynn's Lydenburg for the month of October: Tons crushed, 3,112, yielding 1,300 fine ozs. Estimated value of month's output, £5,517; estimated profit for month, £238.

The published results of Transvaal G.M. Estates and Glynn's Lydenburg do not include the increased price now being obtained under the new arrangement for the free disposal of gold shipped since July 25 last. The gold so far sold is equal to about two months' output of the Witwatersrand and has realised a premium of approximately 16 per cent. Any increased profits obtained by the companies will be published quarterly after receipt of account sales.

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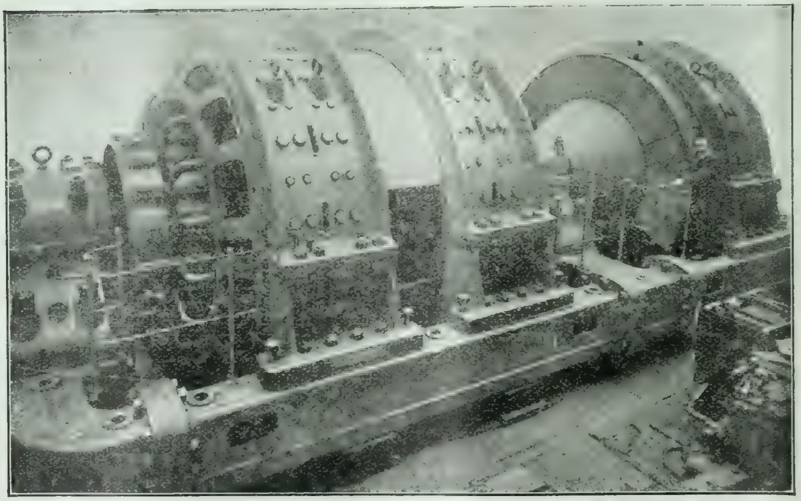

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SALT MANUFACTURE IN SOUTH AFRICA.

An Outline of its Production from an Engineering Point of View.

[By J. E. Parker, M.I.Mech.E., M.A.I.M.E.]

The production of a good and pure salt, whether for domestic, manufacturing or preserving purposes, is to any community a matter of utmost importance, and in order to foster and retain such an industry, it is incumbent upon the Government and the producer alike to endeavour by all means possible to bring it to a high state of efficiency both as regards the article produced and the facilities for disposing of same. These remarks apply with especial force to South Africa, which country is now entering into competition with the world's purveyors of foodstuffs and other commodities requiring salt for preserving, manufacturing, and the like.

Sources of Supply.

Most countries are abundantly provided with the elements used in the production of salt, either in the form of salt deposits, rocksalt, or brines; unfortunately, the literature dealing with this subject, especially the technology of salt-making, is not so comprehensive, nor has it received that attention from our scientists as the importance of the subject demands. The non-metallic sources of South Africa—with the exception of salt-pans—have so far been practically neglected, and very little is known as to the geology or chemical composition of the salt occurrences, neither have any operations been undertaken to prove the existence or otherwise of underground sources of brine, or salt deposits. The known sources of salt in this country occur in the form of "pans" or "lakes," which are ordinary depressions in the country rock, probably caused through volcanic action, which form a receptacle for the brines as they filter through the surrounding rocks. Regarding the permanency of the supply of brine available from these pans, no reliable data which might be useful in computing capacities are kept by any of the owners of salt-pans in this country, but the small area of these pans and their unusually high altitude, does not lead to an optimistic view of their potentialities. Any theory in regard to the source of brine supply to the salt-pans would necessarily require facts and figures of a substantial character before being definitely accepted. It is therefore only put forward as a suggestion, that the salt-pans, as we know them in South Africa, are not the true source of supply, but owing to their slightly lower altitude they merely act as a receptacle for the rising brines, which may be in the immediate vicinity. In support of this theory, we have several strong arguments, *e.g.*, "Any attempt to sink below the natural inflow of brine, or into the hard rock bed of the pan, has invariably met with disastrous results." "Usually there are several pans within a short distance of one another, but only one will be found to give an adequate supply, the others are gradually drying up or are already dry, which seems to point to the brines having emanated from the same source." It will also be noted that the brines are of a consistent density, and are equal to those brines usually obtained at a considerable depth below the surface.

Uses of Salt.

Salt is used in such a variety of ways and for so many purposes that it is only possible to enumerate a few of the most important. It is used for all kinds of culinary purposes, in meat packing, fish curing, dairying, and other industries to prevent deterioration. It is also used extensively in agriculture, for refrigeration, in the treatment of gold and silver ores by chlorination, in the preparation of soda ash, caustic soda, and numerous other chemicals containing a sodium base, the glazing of pottery, enamelling, salting cattle, curing hides, making pickles, and a host of other uses, which are constantly being developed by the expert chemist owing to its cheap and inexhaustible supply.

South African Possibilities

The demand for salt in South Africa should, in the immediate future, be a very considerable one, and providing the quality of the local product is maintained up to the same high standard of purity as the imported article, the industry is bound to be a large one. Fuel is the heaviest item in connection with the production of salt by artificial evaporation, and as it takes between $1\frac{1}{4}$ and $1\frac{1}{2}$ tons of coal to produce two tons of salt, it will readily be seen that our low fuel costs certainly places South Africa in a highly favoured position. The salt maker in Europe and America is paying something like 100 per cent. more for his fuel, and at the same time is able to dispose of his salt at a much less figure; whereas the ruling price of the South African article to-day is in the neighbourhood of 60s. per ton, the American product is approximately one-third of that amount. It will therefore be apparent that with the above advantages, together with a properly designed and equipped plant, producing a high grade salt, it should be practically impossible for any country to compete with us for our own consumption; indeed the probabilities are that we would be in a position ourselves to compete in the world's markets.

Establishing Works.

Before establishing salt, chemical, or other works of a like nature, incurring a heavy capital outlay, it is necessary that an abundant and permanent supply of brine is assured, and as previously pointed out, the supply from the pans may be strictly limited. This as indicated above must be ascertained by means of prospecting and drilling in consultation with the geologist and chemist. The processes employed in the manufacture of salt by evaporation may be classified as follows: No. 1, solar evaporation; No. 2, direct heat evaporation; No. 3, steam heat evaporation; No. 4, vacuum-pan evaporation.

Solar Evaporation.

Nos. 1 and 2 are the only systems so far in operation in South Africa. Solar evaporation is carried on in most countries where the atmospheric conditions are favourable, but is mostly confined to arid countries. The salt produced by solar evaporation owing to its being contaminated by dust, dirt, sand, and the adhering bitterns, requires careful washing and refining, in order to make it suitable for any class of meat preservation, dairying, or table use. When the salt is lifted from the crystallizing ponds it is contaminated with a considerable amount of adhering bitterns, which are strongly impregnated with sulphates and other deleterious matter, also sand, dirt, and particles of decayed vegetable matter, deposited in the ponds by wind and other agencies during the period of crystallizing. It will therefore be seen how necessary it is that salt made under these conditions is thoroughly freed from these impurities, if it is required for table use, dairying, meat packing, curing, and like uses. The washing of salt is a simple, effective and inexpensive process; the manner of its accomplishment depends largely on the lay-out of the general plant. The brine for the first wash is concentrated to complete saturation, and consequently dissolves a minimum amount of salt during the washing; the salt is next washed with artificial salt, *i.e.*, made from salt and fresh water. It is then lifted from the vat, drained and stacked, unless it is intended for the better grade of salt, in which case it is subjected to further refining; from the vats it is conveyed to a centrifugal machine by which the adhering water is removed, is then conveyed to revolving dryers, crushed and finally screened and graded.

Direct Fired Pan Evaporator.

From the foregoing remarks on salt produced by solar evaporation, it will be obvious that to produce a good and pure salt by this method necessitates considerable plant, also much handling with its attendant heavy charges; the operations are confined to a limited number of months of the year; whereas the operations of the direct fired or artificial salt pan goes on night and day all the year round, does not require the same amount of handling, and for the better grade salt yields bigger profits. The preliminary treatment

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of the brines prior to feeding into the evaporating pans varies somewhat, and depends to a large extent on the purity of such brines and their chemical constituents. In modern and up-to-date plants where the purity of the finished salt is the chief desideratum, the brine is delivered from the wells into settling tanks to allow the escape of gases such as hydrogen sulphide; a thin emulsion of lime is added which through its chemical action precipitates any iron compounds which have a tendency to discolour the salt. If the salt is intended for dairying purposes, soda-ash may be added, and after a day or two the brine becomes perfectly clear, and is ready for evaporation. The dimensions of these direct fired pans vary considerably in different countries and districts, but the principle of operation remains the same; they vary between 12 in. to 24 in. deep, 12 ft. to 24 ft. wide, by 60 ft. to 130 ft. long, the fuel used being coal or refuse. The larger and most up-to-date salt manufacturers favour the pan with the larger area and shallow depth as being the most economical to run; these pans are divided into three sections: the front section 70 ft., second section 30 ft., and the backpan or preheater section 30 ft.; the front part of the pan is the evaporating pan proper. The brine is conveyed from the settlers to the back or preheater, where it is heated by the waste heat or gases on their way to the chimney from the fires under the front pan, thence it passes through syphons into the second section, where it is brought to a higher temperature before it is syphoned into the front section or evaporator proper. When the front pan is full enough the flow is stopped, and as the salt is removed to drain, a further supply of warm brine from the second section is received, and the latter in turn refilled from the preheater, which again receives its supply from the settling tanks. At regular intervals of from two to five days, the bitterns are allowed to go to waste, or for treatment at the chemical works. These pans—commonly called broad pans—do not lend themselves very well to mechanical arrangements for lifting the salt as it crystallizes out, and with a few exceptions this part of the work is mostly performed by hand. From the pan the salt is conveyed through its various operations by a series of conveyors and elevators to dryers, crushers and screens, the graded salt is either delivered to the stores or packing rooms, where it is automatically weighed, filled into tins or bags ready for the consumer.

Grainer Process.

Whereas the broad pan is direct-fired, with its many objectionable features, the grainer process is evaporation by steam heat which owing to its possibilities in regard to economy, and its purely automatic control, shows the greatest advance yet made in regard to the cheap production of the better grade salt. The manufacture of salt by the grainer process is mostly carried on in conjunction with some other industry, whereby the waste products of combustion, exhaust steam, or tail-water of the condenser from adjoining works can be utilized for the evaporation of the brine. The grainer may be made of wood, iron, or reinforced concrete; the latter is the latest practice and has proved more endurable than any other material for the construction of these tanks. The economy of the grainer over the broad pan is as much as 60 per cent. in efficiency. The dimensions of these tanks vary from 140 ft. to 150 ft. in length, by 12 ft. wide, and 20 in. to 24 in. deep. The method of heating the brine is by passing steam through a series of pipes immersed in the brine to be evaporated; these pipes are from 3 in. to 5 in. diameter, and six to ten in number, and are hung on pendants so that their tops are one foot or less from the bottom of the vat. The steam after passing through the grainer or grainers is more or less condensed, but still contains a good many heat units, which are utilized in the preheaters. The arrangement of the grainer is more adaptable to mechanical manipulation than is the case with other systems, and generally gives greater efficiency where care is taken to conserve the heat wherever possible, and to handle the salt as little as practicable. The salt, as quickly as it is formed, is pushed along the bottom of the pan by a mechanical raker on to an apron at the end of the grainer, where it is allowed to drain before being pushed into the mechanical conveyors for delivery to warehouse, dryers, crushers, screens, etc., and so on to the packing rooms, where machines do the weighing, filling, and even to the sewing of the small bags used for household salt.

Vacuum-Pan Process.

Although some of the first patents relating to this process date back a century, it is only within comparatively recent years that the vacuum-pan has been brought to its present state of perfection for salt making. The vacuum-pan process owes its economy to its effect in lowering the boiling point of the brine, therefore effecting considerable saving in fuel. This idea has been greatly elaborated in recent years, and from the ordinary single effect pan of the past has evolved the quadruple effect pan of the present day which gives a correspondingly higher efficiency, and whereas the former had a diameter of about 4 ft., and working in single effect, the latter range up to 30 ft. in diameter, with a capacity in triple effect of one thousand tons per day. The salt produced by the vacuum-pan is usually such as may be intended for dairy and table use, it has a very fine lustre and a close even grain of nearly perfect cubical shape which makes it easily distinguishable from that made by any other process. The character of the machinery, quality of labour, and the use of labour-saving devices have completely revolutionized the salt industry during the past twenty years. The development of mechanically raked grainers and the establishment of the vacuum-pan process in the production of high-grade salt, has shown the skill of the mechanical engineer when applied to industrial development. In some of the modern grainer and vacuum-pan plants the salt is not touched by the hand from the time it crystallizes from the brine until it is ready for loading on the railway trucks or steamboat. The character of the labour naturally, instead of remaining purely manual, has undergone a complete change as more complex machinery has been adopted, until a large proportion of the work in modern plants requires mechanical skill of an advanced type, and the chemical engineer is also called frequently into conference. All these improvements have tended towards increased efficiency and the production of a high-grade article at as low a price as is compatible with the existing demand for high quality.

It will be noted that Brines vary considerably in chemical analysis due to variation in rock formation, therefore a careful survey of each district containing brines, also complete analysis of such, would probably reveal Bromine, Potash salts and other chemicals of a distinctly valuable nature.

There is also the possibility of utilising the residual bittern (mother liquor) from salt making for extracting the magnesium salts, etc., after which the residues could still further be treated for the production of low-grade fertilising material, such as Hartsalz, Manure-salts, "Woodstone" and Magnesium-oxychloride cement (an excellent non-conductor of electricity) which would be useful for many purposes, and an ideal composition for electric switchboards.

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THE OCTOBER OUTPUT IN DETAIL.

Barnato Group.

The results of operations of the Barnato group for October are as follow :

Mine.	Stamps.	Tons Crushed.	Revenue from Gold
Consolidated Langlaagte	100	42,400	£53,405
Government Areas	200	126,000	217,826
Langlaagte Estate	200	38,520	47,347
New Primrose	100	17,100	17,581
New Unified	60	11,500	11,930
Randfontein Central	600	150,000	177,641
Van Ryn Deep	90	50,700	113,278
Witwatersrand	215	34,350	39,232
Totals and averages ...	1,565	470,570	£678,240
September totals ...	1545	457,750	£655,634

Mine.	Total Working Costs.	Working Costs per Ton Milled. Shillings.	Gross Profit including Sundry Revenue.
Consolidated Langlaagte . .	£44,495	20·988	£9,147
Government Areas	128,417	20·384	90,025
Langlaagte Estate ...	43,187	22·423	4,337
New Primrose	16,330	19·099	1,344
New Unified ...	10,262	17·847	1,702
Randfontein Central .	168,527	22·470	9,956
Van Ryn Deep	53,755	21·206	60,034
Witwatersrand . .	37,049	21·572	3,643
Totals and averages .	£502,022	21·337	£180,188
September totals .	£483,578	21·128	£176,048

Monthly Gross Profit, 1919.—January, £162,943; February, £154,054; March, £179,310; April, £180,785; May, £190,416; June, £184,687; July, £194,398; August, £170,255; September, £176,048; October, £180,188.

Note.—These results do not include the increased price now being obtained under the new arrangement for the free disposal of the gold shipped since 25th July last. The gold so far sold is equal to about two months' output of the Witwatersrand and has realised a premium of approximately 16 per cent. Any increased profits obtained by the companies will be published quarterly after receipt of account sales.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of October of the undermentioned companies of the Consolidated Gold Fields group :—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared, Fine Ozs	Total Profit
Simmer and Jack	320	7	51,200	13,480	£4,199
Robinson Deep	160	10	57,300	19,068	9,984
Knights Deep	400	11	84,900	15,215	4,555
Simmer Deep ... ...,	220	10	50,800	12,547	1,267
Jupiter	80	5	26,300	7,332	2,839
Sub Nigel	30	2	9,700	6,211	5,924
Totals	1,210	45	280,200	73,853	£19,658

Gold in reserve.—Simmer and Jack, 1,125 ozs.; Robinson Deep, 1,810 ozs.; Sub Nigel, 2,290 ozs.; total, 5,225 ozs.

The published results do not include the increased price now being obtained under the new arrangement for the free disposal of the gold shipped since 25th July last. The gold so far sold is equal to about two months' output of the Witwatersrand and has realised a premium of approximately 16 per cent. Any increased profits obtained by the companies will be published quarterly after receipt of account sales.

Transvaal G.M. Estates.

The following are the particulars of the output of the Transvaal G.M. Estates for October:—Central Mines: Tons crushed, 12,600, yielding 2,535 fine ozs. Elandsdrift Mine: Tons crushed, 1,360, yielding 538 fine ozs. Vaalhoek Mine: Tons crushed, 1,930, yielding 427 fine ozs. Estimated value of month's output, £25,963; estimated profit for the month, £4,979.

In continuance of their "Safety First" campaign, the London General Omnibus Company recently placed the following adapted quotation from Shakespeare on the rear of most of their omnibuses: "To be or not to be—Careful."

S.A. Railways and Harbours.

IMPORTANT NEW WORKS AUTHORISED DURING SEPTEMBER, 1919.

Cedara Nottingham Road.—Preliminary work in connection with deviation between.

Newtown.—Provision of additional siding and platform facilities at.

Fishhoek.—Opening up of as a full station.

Randfontein.—Provision of a balloon curve.

Hutchinson.—Alterations and additions to yard and station buildings.

Kazerne.—Provision of additional shed accommodation.

Capetown.—Provision of additional siding and platform accommodation at Catering Store.

Mafeking-Johannesburg.—Erection of additional telegraph line between.

Capetown.—Provision of a new parcels office.

Cambridge.—Erection of house for station foreman and convert present quarters into station buildings.

Kei Road.—Erection of house for station foreman and convert present quarters into station buildings.

Kubusie.—Erection of house for station foreman and convert present quarters into station buildings.

Cyphergat.—Erection of house for stationmaster and convert present quarters into station buildings.

Kroonstad.—Electric lighting of railway streets and quarters.

Capetown.—Installation of water meters at

Hex River.—Equipment of well for loco. water supply.

Capetown-Salt River.—Replacement of two miles of electric light cable between.

Durban Harbour.—Provision of a graving dock.

Durban Harbour.—Provision of six 4-ton electric cranes.

Table Bay Harbour.—Provision of one non-propelling hopper-barge of 200 tons capacity.

Table Bay Harbour.—Provision of five 4-ton electric cranes.

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THE OUTSIDE MINES OF THE TRANSVAAL.

[By T. G. Trevor.[*]

The Pretoria Inspectorate of Mines consists of the following Magisterial districts: Zoutpansberg, Pietersburg, Waterberg, Rustenburg, Pretoria, Middelburg, Carolina, Lydenburg, Barberton. It, therefore, includes the vast majority of the "outside" mines of the Union. Coal and diamond mining are not included in this review, as the conditions governing them are different.

Mining Ventures.

There are four stages in the history of a metal mine, viz.: (a) The preliminary prospecting stage; (b) the exploration prospecting stage; (c) the development stage; (d) the producing stage.

(a) *The Preliminary Prospecting Stage.*—In this stage a prospector or owner examines an area of country in search of indications worth exploitation. The Mines Department usually receives no notice of work at this stage, the actual cost of which seldom amounts to £50. It is probable, however, that, taking the Inspectorate as a whole, at least twenty-five farms or areas are examined for one that gets taken up for prospecting.

(b) *The Exploration Prospecting Stage.*—In those cases where something is found, the next step is usually to secure an option on the farm or to peg the claims, as the case may be, and to float a small syndicate to prospect the area. In this case there is generally an initial expense of at least £150 for option money, and up to £2,000 may be spent on the property before it is abandoned or the next step reached. The money for this object is usually found by some small syndicate either in the district town or in the Union. In the years under review 464 of these ventures were reported to the Mines Department: of these 141 never got beyond this stage, but 323 carried on. These 141 prospecting ventures must have been closed down at a dead loss, which may be estimated on the average at least £500 = £70,500.

(c) *The Development Stage.*—The local syndicate, having expended their capital and obtained what they consider good results, usually attempt to float a company or to get a big mining house to take up the property. In the former case the capital may be local, and now frequently is, but in the latter case it is almost invariably from overseas. Of the 323 properties which reached the development stage in the years under review, 122 got no further, but 201 succeeded in advancing to the next stage. The 122 mines which closed down during the development stage may be estimated to have closed at an average loss of about £2,500 each = £305,000 for the period.

(d) *The Producing Stage.*—When the owners believe that the property has been proved to have a reasonable chance of being payable, it is usual to float or refloat it into a definite mining company. The amount of capital of such a company may be anything, and sums up to £200,000 are not unusual. What proportion of this is working capital and actually goes into the mine or into plant, it is impossible to state. In considering the huge prices at which properties are put into companies it must be remembered, however, that these properties represent prizes in the lottery of prospecting and that, therefore, they must have a value commensurate with the risk and difficulty of obtaining them. The money for this stage has almost invariably come from abroad, and even if in the first instance the company is financed in the Union, the greater portion of the scrip generally goes abroad and the equivalent cash is received in the Union. It must also be borne in mind that, though the capital of a company may be out of all proportion to the working capital, yet the money for the shares issued to water the capital ultimately comes from the investing shareholder, who is the mainstay of the mining industry. Though this ultimate shareholder has no say in the price at which he comes in, if he is unduly victimised, either by overcapitalisation, or by taxation for any considerable period of time, he will no longer invest; he is literally the "goose that lays the golden eggs," and starving or victimising him by any method will result in curtailing the supply of capital. Of the 201 mines which reached the producing stage, 70 were still producing at the end of the period under review. Of these, however, only 30 survived till the 31st May, 1919. Of the 131 mines which started producing but closed down during the period, six were successful and repaid their workers, 11 may be classed as doubtful, the owners probably coming out about level, and 114 were distinct failures. Of the 70 which still continued producing at the end of the period, 40 have since closed down; of these 34 did not return their owners' capital and interest, two were probably successful and four doubtful. Of the 30 mines still running on the 31st May, 1919, 20 have probably been highly successful, having returned both capital and interest—in some cases many times over, eight can never be expected to repay their capital unless very unforeseen circumstances arise, while two are still doubtful. It is practically impossible to give actual figures as to the capital involved in these 201 mines which started crushing, but the capital of the 14 largest concerns amounts to £3,215,000. The remaining 187 concerns were mostly smaller ventures, and if we average their capital at £10,000 each, it is thought that it would be a conservative estimate (£1,870,000). It is, therefore, probable that the total amount of money directly invested at cost price (par) in metal mining during the period under review in this Inspectorate was not less than: (a) Preliminary prospecting stage, unknown; (b) exploratory prospecting stage, £70,500; (c) development stage, £305,000; (d) producing stage, £5,085,000; total, £5,460,500. To summarise, 464 mining ventures started, and of these 28, or, say, 6 per cent., have been definitely successful. The success of 17 is still doubtful, while 419 were definite failures. The 6 per cent. must, therefore, be regarded as prizes in a lottery in which the odds are 16·6 against the winner. To make the gamble an honest and attractive one the winner should, therefore, recover at least 16 times his stake, plus interest. It is certain that in very few cases has this happened. Probably the only case on record in the period under review where it has occurred is that of the Zaaiplaats Tin Mines. It is, therefore, obvious that, from the point of view of cold reason, speculation in these mining ventures is not a profitable one, though it is certainly attractive, otherwise so much money would not be forthcoming for it. It remains to be shown in the forthcoming chapters whether or not it is profitable to the State.

Production.

The production of metals during the period under review was as follows: Gold, £7,740,438; tin and copper, £2,792,721; total, £10,533,159; giving an average per year of £1,053, 315. What amount of the above is profit or loss it is impossible to state, but the following statement shows the amount spent in wages and the approximate amount for stores. The stores for the first six years are taken from the Government returns, but for the years 1911-1914 these returns are included with those of certain other districts. The approximation is, therefore, arrived at from the average of the first six years: Wages—White, £1,884,668; coloured, £2,269,731; stores, £3,820,585, total, £7,974,984 Subtracting this sum from the total receipts for metals sold we get £2,558,175 This sum of £2,558,175 has to cover all other expenses, including direct taxation.

Direct Taxation

Direct taxation takes two forms, viz.: (a) Profits tax, (b) mining licences [illegible] During the period under review the paying mines declared £2,700,000 in profits, of which £500,000 was allowed for amortization, leaving a total taxable profit of £2,201,290, and of this the Government took £220,089 for the 10 per cent profit tax. (b) Mining licences, *i.e.*, claim, stand and mynpacht licences, amounted to £571,263. The total direct revenue derived by the Government was therefore: (a) Profit tax, £220,089; (b) mining licences, £571,263; total, £791,352. This is the last figure of cost at which we can arrive, and our balance sheet now stands as follows: Cr.—Metals sold, £10,533,159. Dr.—Wages and stores, £7,794,984; direct taxation, £791,352; balance, £1,766,823. The above balance has to account for all other expenses, save those mentioned, also interest and amortization for ten years on a capital which we have estimated at £5,460,500, which it is obvious it is insufficient to do.

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[*] From paper read before C.M. & M. Society.

(To be continued.)

Cape Diggings Diamond Output.

SEPTEMBER RETURNS.

The output of diamonds from the public diggings in Cape Province during September was as under:—

	Carats.	Value.
BARKLY WEST.		
Delport's Hope	166¼	£2,481
Eland's Drift	23¼	281
Forlorn Hope	0¾	11
Gong Gong	239½	3,469
Good Hope	317	3,676
Harrisdale	168¼	2,845
Hebron	306¼	5,615
Holpan	63¾	996
Jonas Kopje	7¼	72
Kareepan	366½	6,486
Keiskama	28¼	294
Klipdam	359½	5,332
Klipdrift	137¼	1,773
Last Hope	25¼	250
Longlands	255¼	7,790
Niekerk's Rush	14¾	176
Rickett's Prospect	33¼	648
Scholtz's Prospect	85¼	1,839
Snyder's Rush	58	1,093
Van Zoelen's Laagte	22	262
Waldeck's Plant	317½	7,038
Ward's Hope	17	223
Winter's Rush	387¼	8,870
	3,400¼	£61,531
HERBERT.		
Mosesberg	1,119½	£25,682
Schmidt's Drift	225½	3,953
Brypaal	50¾	730
Davisdrift	32½	613
Sevonelles	1¾	15
	1,730	£30,944
KIMBERLEY.		
Robinson's Kopje	23¼	£696
Wedberg	13½	325
	46¾	£1,021
TAUNGS.		
Home Rule	1,881¾	£32,244
Killarney	30	90
	1,911	£33,144
PRIVATE ESTATES		
River View Diamond Syndicate	183¼	£3,271½
New Vaal River D. & E. Synd	755	13,937¼
Pniel Estate	218¾	1,619

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THE WEEK IN THE SHAREMARKET.

Gold Shares Quiet—Diamonds Active—Syndicates in Favour.

The market was much quieter for gold stocks this week, though prices remain steady. The activity was considerable in diamonds and all the syndicates were in favour. New York messages report an extraordinary diamond buying boom, which is said to be affecting all countries. Diamonds are being bought because they are the most convenient form of concealing wealth in disturbed countries. Prices in some cases have advanced 500 per cent. Diamonds which were sold before the war at £20 per carat are now fetching £120 per carat. Germans, Russians and Turks are purchasing diamonds, and working men in France and Italy are buying them in a small way. China and Japan, where many war fortunes have been made, are taking large quantities of the precious stones. This, of course is excellent news for our diamond producers, and has had a most encouraging effect on the whole industry. The week's changes are as follow:

	7th. Fri.,	8th. Sat.,	10th. Mon.,	11th. Tues.,	12th. Wed.,	13th. Thurs.,
African Farms	16 8*	15 9	16 0	16 0	16 0	16 3†
Anglo.-Amer. Corp	57 6	60 6	59 3	61 0	62 3	61 0
Apex Mines	7 7*	7 6*	7 7*	7 9	7 7*	7 9*
Aurora Wests	—	—		8 0†	8 0†	—
Bantjes Cons.	3 3*	3 6†	—	3 6	3 5*	3 1*
Blaauwbosch Dias.	—	—	—	—	70 0*	—
Brakpan Mines	69 6*	70 0	68 0*	68 0*	68 6*	68 6*
Breyten Colls.	10 0*	10 0*	10 0*	—	10 0*	10 0*
Brick and Potteries	4 6*	4 6*	—	4 6*	4 6*	—
British S.A.	23 0	23 0	23 0	21 6*	22 6*	22 0
Bushveld Tins	2 6	2 6*	2 7*	2 7*	2 6	2 6†
Cinderella Cons.	—	—		5 0*	5 0*	5 0*
City and Subs.	7 6*	7 6*	7 9	9 3	8 9*	9 0†
City Deeps	63 0†	60 0†	—	63 0†	60 0*	62 0*
Clydesdale Colls.	28 9*	28 9*	28 9*	29 0*	29 0*	28 6*
Con. Investments	33 0†	33 0†	—	—	32 0*	32 3*
Con. Langlaagtes	22 6	22 0*	22 0*	—	22 6†	25 0†
Con. Main Reefs	11 7*	11 9	11 9*	11 7	11 6*	11 9
Con. Mines Sel.	30 0	30 6*	31 0	31 0	30 6*	31 0
Coronation Frees.	2 3*	2 3	2 3*	2 6*	2 4	2 5
Coronation Synd.	10 0*	12 0*	10 0*	10 0*	—	14 9†
Crown Dias.	10 6	10 4½	10 6	10 9	10 11	11 3
Crown Mines	67 6	65 6*	—	65 0*	66 0*	65 0
Crown Mines Deb.	—	—	£68†		—	—
Dagafontein Mines	22 3	22 6*	22 4*	22 3*	22 9*	—
Do. Options	6 0	6 0*	7 0	7 0*	—	7 0*
De Beers Cons.	£29¼†	£29½	—	—	—	—
East Rand Coals	3 1†	2 11	2 10	2 11	2 10	2 10
East Rand Deeps	1 0*	1 3	1 1	1 1*	1 2	1 2*
East Rand Props.	8 6	9 0	9 3	10 0	10 0	9 11
East Rand Debs.	£67½*	£67½*	£67½	£67½*	—	£70*
Eastern Golds	1 9*	1 7*	1 9†	1 0*	2 0†	2 0†
Ferreira Deeps	11 0*	11 6†	11 6†	9 0*	10 6†	10 3†
Frank Smith Dias.	7 3	7 2	7 5	7 5	7 5	7 3
Geduld Props.	59 0	58 0*	59 0	59 0	59 6	59 0*
Ginsbergs	—	—	—	2 9†	2 9†	—
Glencairns	—	1 0*	1 0*	1 0*	1 0*	—
Glencoe Colls.	6 0*	6 0*	6 0*	—	—	—
Glynn's Lyden.	—	15 0*	15 0*	16 0*	16 0*	—
Govt. Areas	98 0	97 0	96 6*	—	97 3*	96 6*
Hume Pipes	24 0	23 0*	24 6*	24 3*	24 9*	24 6*
Jhb. Bd. of Execut.	—	—	—	30 0*	—	30 0*
Jupiters	4 6*	4 9	4 6*	4 6*	4 6*	4 6*
Klerksdorp Props.	2 1*	2 1	2 0*	2 1	2 0*	
Knight Centrals	6 3*	6 4*	6 6	6 4*	6 7	6 7
Knights Deep	9 0†	—	—	8 0†	6 0*	6 3*
Lace Props.	22 7½	22 9A	22 3*	22 3	22 0	21 6*
Leeuwpoort Tins	30 6*	31 0	31 0		31 0	30 9
Lydenburg Farms	8 9*	8 9	8 8	8 9*	8 6*	8 8
Meyer and Charl.	92 6*	92 6*			92 6*	92 6*
Middelvlei Est.	—	2 0*	2 3†	2 3		
Modder B's	178 0*	180 0†	177 6	178 3*	178 0	177 6
Modder Deeps	49 6	49 6	50 0*	50 3	50 9	51 3
Modder Easts	33 0	32 7½	32 9	32 6	32 3	32 6
Do. Options (3yrs.)	13 4½	13 6	13 3*	13 3	13 6	13 3
Do. Options (4yrs.)	15 6*	15 6*	15 7½	15 9	16 1½	15 8
Natal Navig. Colls.	27 6*	27 0*	28 0*	27 6*	28 0*	28 0*
National Banks	£15½†	£15½†			£15 7†	£15 7
New Boksburgs	2 6†	1 10	1 10*	1 10*	1 10*	1 10*
New Eland Dias.	64 6	62 6*	62 6*	66 0*	72 0	74 9
New Era Cons.	12 0	12 0	12 6†	11 9*	12 3	11 9
New Geduld Deeps	2 6*	2 0*	2 0	2 0*	2 0	2 0
New Heriots	10 0	10 0†	8 0*	9 6†	8 6*	8 6*
New Kleinfonteins	12 6	12 3*	12 4	12 6	12 3*	—
New Modders	£30	£30*	£30½	£30*	£30⅛	£30*
New Primrose	6 0†	6 0†	6 0†	6 0†	6 0†	12 0*
New State Areas	32 6	32 6	32 3*	32 0A	32 3	31 9*
New Stocks 4½ p.c.	£102*	£102*	£102*	£102*	£102*	£102*
New Stocks 5 p.c.	£100⅞*	£100¾*	£101¼†	£100⅝*	£101	£101¼
New Unifieds	5 0*	5 0*	5 0*	5 0*	5 0*	—
Nigels	—	—	7 6*	8 0	9 0†	5 0*
Nourse Mines	—	13 6*	15 0†	15 0†	—	16 0†
Pretoria Cements	98 6†	95 0*	94 6*	94 6*	97 0	97 0
Princess Estates	2 8*	2 9*	2 9*	2 9	2 9*	2 9*
Rand Colls.	—	—	3 6*	3 9	3 6*	3 6*
Rand Nucleus	2 0*	2 0*	2 0*	2 1	2 1*	2 0*
Rand Select Corp.	90 0	92 6	92 6	92 6	92 0	91 0
Randfontein Deeps	6 9*	6 6*	6 9*	6 7*	6 6*	6 6*
Randfontein Est.	26 6†	—	25 3*	25 9	25 9	25 6*
Roberts Victors	16 6	16 3	15 6	14 9*	15 6	15 6*
Rooibergs	6 6*	6 6*	6 6*	6 7*	—	6 9
Ryan Nigels	—	5 6†	—	—	—	5 6†
Shebas	2 3†	—	2 0*	2 0*	2 0*	2 0*
Simmer and Jacks	—	8 6*	6 0	6 3*		6 6*
Simmer Deeps	2 6	2 5*	2 0*	2 3*	2 3*	2 3
S.A. Alkali	44 0	43 6	43 0	42 6*	42 0	40 0*
S.A. Breweries	—	40 0*	40 0*	40 0*	—	40 0*
S.A. Lands	6 7	6 7*	6 8	6 6*	6 9	6 8
S. Van Ryns	9 0	8 6*	8 7½	8 6*	8 6*	8 9
Springs Mines	55 9	55 0	54 6	54 9	55 3	56 0
Sub Nigels	24 3	22 6	22 3	21 9	20 9*	20 6
Swaziland Tins	—	19 0†	19 0†	18 0†	18 0†	18 0†
Transvaal Lands	—	—	26 0*	27 6†	27 6†	27 6†
Trans. G.M. Est.	17 0†	16 0†	15 9†	14 3*	16 0†	16 0†
Tweefontein Colls.	26 6	26 6	—	26 0*	—	26 0*
Union 5 p.c.	£102⅞*	£102⅞*	£102¾*	£102⅞*	£103	£103/1/3
Van Ryn Deeps	88 6	89 9	89 6	89 9	89 3	89 0*
Village Deeps	16 0†	15 0	9 6†	—	14 0*	14 0*
Village Main Reefs		—		8 6†	8 9†	8 9
Welgedachts	30 0*	—	—	—	—	—
West Springs	26 0	26 0	26 0	27 0	27 0	27 6
Western Rand Est.	8 4	8 4*	8 6	8 6	9 0	10 6
Wit. Deeps	10 0†	8 9*	9 0*	9 0*	9 0*	9 0
Wolhuters	3 7*	3 10†	3 6*	3 6*	3 9†	3 4*
Zaaiplaats Tins	7 7	7 7	8 0	9 3	8 3	8 3

*Buyers. †Sellers. AOdd lots. BEx London.

PERSONAL.

Mr. Herbert Ainsworth has returned to the Rand.

* * * *

Mr. Harry Graumann, M.L.A., has returned from England.

* * * *

Sir David Harris has been representing the diamond industry at the Pretoria Conference during the week.

* * * *

Mr. Sankey, Prof. Dobson's successor, is expected here from Port Elizabeth during the month to take over his duties as from December 1st.

* * * *

We hear from Professor Yates that the Royal School of Mines, London, is experiencing quite a rush of applications for its courses; when the mail left sixty-five first-year men had already enrolled and a further hundred candidates were to sit at the entrance examination.

* * * *

Messrs. Blane & Co., Ltd., who represent Messrs. Glenfield & Kennedy, have been given the contract for 10 barrage gates at the Rand Water Board Vaal River Works. We understand that Messrs. Glenfield & Kennedy are carrying out this contract in conjunction with Messrs. Armstrong and Main.

* * * *

Messrs. Stewarts & Lloyds, the well known importers of pipe fittings and all their accessories, are arranging to move their chief offices from corner of Loveday and Marshall Streets to corner of Main and Mooi Streets, where their warehouses are, the present building where their offices are having been sold.

GOVERNMENT REPORT ON THE PRIESKA NITRATES.—II.

Judicial Survey of the Origin, Occurrences and Commercial Possibilities of the Deposits—Their Interesting History and the Present Position.

[By MESSRS. FROOD AND A. L. HALL.]

IV.—RECOVERY OF NITRATES

Looking now to the question of the Nitrate recoverable from these rocks, the main points appear to be:

1. The regional extension of the deposits.
2. The depth to which they extend.
3. Their continuity along the rock faces.
4. Their extension from the cliff bases upwards, and
5. The conditions under which they can be worked profitably, especially as regards cost of mining and extraction.

1. *Regional Extension of the Deposits.*—The area over which occurrences of Nitrate are known to exist is immense, and strictly from this point of view there can be no anxiety whatever. Griqua Town has already been indicated as marking the limits of the recognised field to the north, but there is no reason to consider that equally rich deposits will not be found beyond this in the area covered by the extension of the Lower Griqua Town series northward.

2. *Depth the Deposits Extend from Surface.*—Originating as they do mainly from animal refuse, it follows that these Nitrates will be found in greatest quantity near the surface of the rock faces where animal life has been most plentiful. In view, however, of the very extensive jointing and fissuring, both vertical and horizontal, formed in these faces, permitting the free passage and spread of Nitrate-bearing solutions in their downward course, it is equally certain that the area of deposition will widen appreciably towards the bottom of the cliffs. The depth of the area of enrichment is a most important consideration, but unfortunately there is still a signal want of evidence that might help to any fair conclusion on the point. Only one tunnel has yet been put in with the object of obtaining information. This was in the middle of the richest section at Spitzkop, and at a distance of 23 feet from the original face, the ground, according to our sample, only showed 1.36 per cent. KNO_3. On the other hand, it is reported that at Middel Water, where the original rock had apparently been removed to a depth of from 20 feet to 25 feet, the face, sampled over 176 inches, still showed an average of 8.2 per cent. of Nitrate. Some of the rich sections we saw elsewhere had been picked at places to a depth of at least 10 feet from the original surface, and were still showing rich deposit in the face. Another consideration leading one to expect a concentration of values near the surface is that here, as the result of weathering, more lodging places are provided for the deposition of the salts. Further, it is here that there will be most soft porous rock to be permeated and enriched, and also here that weakly acid solutions will most readily take up potassium from the weathered and crumbling rock. It would not be fair to urge the above considerations beyond the point that there is likely to be a gradual decrease in the Nitrate content of the rocks as depth from surface is attained. It is possible, indeed, that the Nitrate may continue payable at places to greater depth than might be at all readily expected. So far as present purposes go, this, unfortunately, cannot be proved. There remains an argument to the opposite intend which may be founded on the case of the comparatively rich Nitrate reported as found in the old Asbestos workings at Klipfontein, to which reference has already been made. Here enrichment was found in a tunnel up to a depth of 45 feet from surface, and *there were no overhanging krantzes.* The only explanation of this that I can suggest is that, owing to the numerous vertical joints in these rocks, suitable liquors for the ultimate formation of Nitrate have found their way in from the ground above. Animal life was no doubt most plentiful in the caves and holes and fissures of the krantzes, but there was at the same time a certain amount at the ground surface and also plenty of decaying vegetation, from both of which sources ammonia might be slowly derived and carried downwards into the rocks. If this explanation be correct, it will follow that any or all of these particular rocks may be found to be impregnated with Nitrate for certain distances and in varying degrees, not only following the dip of the strata inwards but also from the ground surface vertically downwards. It can only be said that as yet there is no certainty that this is not the case. It should be kept in mind, however, that the roofs and sides of caves and tunnels afford most favourable conditions for the concentration of Nitrates, and that samples from such places must be received with the greatest caution. In any event, the consideration to be kept in view is not the general distribution of these deposits, but the areas over which sufficient concentration of values has occurred to permit of profitable extraction, and for this we must undoubtedly look to the cliff faces, so far as our present knowledge carries us.

3. *Continuity Along the Rock Faces.*—This is perhaps the most important point of all; for it is evident, from what has been said already, that if, in any section of a krantz, payable values are not found at the base, they are very unlikely to be found elsewhere, whether upwards, downwards, or inwards. In particular, if a rich section is found, after a short distance, to turn quite unpayable in either direction, it has a very discouraging effect on the whole question. For this reason, particular attention was paid to this aspect of the problem, and half the samples we took were selected more or less with a view to this particular determination. I regret to say that, both from the results of the samples and from my own observations, I am obliged to conclude that values are by no means continuous along the cliffs, and that, in fact, only comparatively limited sections afford promise of payability. On the other hand, it is right to point out that nowhere we tried did we fail to find Nitrate in some quantity, even if affording no hope of payability. From this fact, and looking to the number of rich sections already discovered, it seems a fair and obvious inference that, with further prospecting and development, many more such sections will be discovered in any particular range of cliffs. The only consideration that, to my mind, could modify in any degree the above conclusion as to the complete failure in continuity is that the effect of exposure may not have been sufficiently estimated. With comparatively small samples taken necessarily from the more or less exposed and weathered face, this danger could not be avoided.

4. *Extension from the Cliff Bases Upwards.*—Standing on the ground level, one can see at many places indications of Nitrate values higher up in the cliffs. There may even be seen what looks like a regular zone of enrichment in places. But, unfortunately, beyond what the eye tells—and this is apt to prove deceptive in such a case where there is no information available. No section of cliff has been sampled from top to bottom, and so far as one can learn, almost no samples have been taken, or investigation made beyond the portions of the faces readily accessible from the ground. It is not improbable, I should judge, that at some places limited zones may be found at one or more levels in a cliff face that it will pay to stope. On the other hand, looking at these faces as a whole and estimating the enormous preponderance of stone in proportion to the possible Nitrate for which room is left, it is not possible to contemplate that any section will be found payable from top to bottom, unless in the rarest case. These views, I need scarcely point out, represent merely an individual opinion, and are only stated because no reasoned conclusion is possible. There is similar uncertainty regarding the rock faces below soil level, which had nowhere been cleared to a depth of more than three feet or so. As I have already said, there appeared to be a tendency to tail off in value at, or a short distance below, the soil line, but beyond this nothing can be said. Whatever may happen above or below, the point has again to be emphasised that the experience of similar deposits elsewhere is that the chief zone of enrichment is always at the base of the cliffs, just above and at the soil line.

5. *Conditions of Work and Profitable Extraction.*—(a) ***Mining***: The mining of the Nitrate-bearing strata will present no difficult. The rock is hard, tenacious, and in a measure elastic, permitting of being safely and cheaply broken. The only method applicable is one of open stoping, breaking in more or less on the horizontal from the faces of the cliffs, and leaving pillars, or building supporting packs, as may be required. The rock thus broken can be lowered by self-acting inclines or other methods to the valleys below and thereafter taken to the treatment plant, which will no doubt be situated generally at a convenient spot in the main valley. The total costs of delivering broken rock at the plant will vary according to the quantity handled and other circumstances, but may be roughly estimated at from 3s. 6d. to 5s. per ton.

(b) *Treatment and Extraction.*—In view of the novelty of the problem of treatment in this country and of the small amount of experimental and determinative work that has been done, it is quite impossible to anticipate what methods will finally approve themselves. It is necessary, however, to form a rought estimate of the probable costs, and to this end certain broad and safe lines may be followed. In the first place, it may be safely anticipated that, prior to treatment, some further reduction of the ground as delivered from the stopes will be necessary, though probably fine rock-breakers will suffice for this purpose. Thereafter, following the general experience in leaching and lixiviating processes,* it will almost certainly be found necessary to treat the coarse and fine ground separately. The coarse can be leached right away, whereas the fine will probably have to be further reduced, whether with the object of special treatment or to be sold in the crude form for manurial purposes. In the latter event, as no manures are likely to be saleable hereafter except on guaranteed values, a process of mixing and standardising will be inevitable. With respect to leaching, it is certain that hot water will be required, and, speaking generally, the hotter the better, in view of the remarkable increase in solubility of Potassium Nitrate with rise in temperature; for, starting at 0 deg. Centigrade, 100 parts of water only dissolve 13.32 of the salt, whereas the proportion rises steadily to 246 parts at boiling point. It is certain also that a succession of washes, two at least and probably three, will be necessary to obtain the best economic extraction† The present idea in the district, I may say, is that only one good boiling, say, for four or five hours, is necessary—which probably accounts for the considerable afflorescence of salts (due to capillary action) appearing on the dumps of treated material, and giving rise to the idea that there is a subsequent regeneration of Nitrate. Finally, there will be the crystallisation of the salt—either by solar or artificial evaporation—drying, bagging, and transport to railway. Enough has already been said to show that work on the large scale is likely to prove more complicated than might have been expected, and certainly it will be found that experimental operations, as hitherto practised, provide, at best, a poor and unreliable criterion as to costs. Neither is it possible, particularly in absence of any data as to what will be the respective proportion of coarse and fine ground to be dealt with—to offer, on a wider view, anything but the roughtest estimate. However, allowing a reasonable margin, my calculations tend to show that the whole costs for crushing and sizing, charging and discharging tanks, power, heating water, pumping liquors, evaporating, drying, bagging, transport of salt to railhead and management, should not exceed from 4s. 6d. to 5s. 6d per ton of rock handled. Taking the above figures for mining costs, which were stated at from 3s. 6d. to 5s. per ton, and costs for extraction, as shown immediately above, at from 4s. 6d. to 5s. 6d. per ton, the total working costs come out at from 8s. to 10s. 6d. per ton. Allow further for reasonable overhead costs and some margin over all, and I estimate that the total costs of producing commercial nitrate on a large scale need not exceed, with good management, from 10s. to 13s. per ton (short) of rock handled. In this calculation, it is assumed that the property worked is within 20 miles from rail-head, that there is a sufficient supply of water available—a very important consideration in this dry country—and that the cost of dealing with the fines does not prove disproportionate to that of treating the coarse product from the crushers.

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* Note.—At the Aqua Santa Oficina in the Northern part of the Tarapaca field, Chili, in 1915, a new process was introduced by which the Nitrate content of the "ripio" (residues) was at once reduced from 6 per cent. to 2.5 per cent. Instead of sending the crushed Caliche directly to the fondatos (boiling tanks), it is first passed over ¼ in. shaking screens, and the undersize, amounting to 20 per cent. of the whole, removed. By removing this fine material, the extraction in the fondatos was increased to such an extent that the ripio then carried only 2½ per cent. $NaNO_3$. The screening would thus have been profitable even had all the fines been thrown away. As a matter of fact, these fines, by a process of fine crushing with water and the utilisation of Butters filters, are made to yield a further extraction.

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† In a test washing, on the Laboratory scale, carried out at the Gray University by kind permission of Professor Rindl, a sample of nitrate bearing rock was foun dto yield 9·6 per cent. of solubles on first lixiviation with boiling water. On second washing, further 1.4 per cent. of solubles was recovered. The rock was then pounded fine and washed again, with the result that still further 1.2 per cent. was extracted. Assuming that all the salts had by this time been got out, the results show that an extraction of only a little over 90 per cent. had been obtained by the first two lixiviations, leaving 10 per cent. still recoverable with further treatment.

Aviation Enterprise.

Major H. Meintjes, M.C., A.F.C., and Captain H. Denoon Duncan, both late of the R.A.F., arrived from England on the Armadale Castle. The former will be manager of the Handley Page South African Transports, Ltd., while Captain Duncan will be secretary. Two Handley Page aeroplanes, with seating accommodation for 16 passengers, are on the water, and should arrive at Capetown early in November. A third machine is expected to reach here a few weeks later. Flying should commence at Capetown during the first week of December. The pilots have been carefully selected, and the aeroplanes are of the type that were used so extensively on the Western and other fronts. Cases have occurred where one of these machines has had one engine put out of action by gunfire, and, with the planes considerably shot about, has returned safely from across the lines. These three aeroplanes precede many others of a similar or improved type, with which it is proposed to run daily services between many centres of South Africa. The company's representatives state: We have intentionally refrained from inflicting upon the public claims which at first may prove to have been an exaggeration. We wish by demonstration to prove the reliability of our aeroplanes, the efficiency of our methods, and the earnestness of our purpose.

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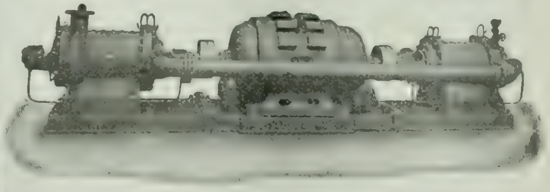

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TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Resumption of Regular Weekly Mail Service—Iron, Steel and Machinery—Electrical Goods—Oils and Colours—Timber and Building Materials—Blue Building and Plaster Lime—The Labour Market.

The best news this week is that a mail service from Southampton to South Africa will be established from November 14th to December 5th. This is in accordance with a cable received by the Union-Castle line. On December 19th the return weekly service will commence. If this can be arranged for a month it can pretty well be taken that this preliminary step will be the resumption of our mail service, and naturally other ships will be added to those already under the Union Castle flag. This is an excellent start and with a few intermediate boats should soon reduce the passenger waiting list in England. An increased service can also be anticipated from the Natal and the other lines touching at the Cape. It is expected that good cargoes will come out by these mail boats, notwithstanding a private cable dated November 5th from England stating that the market there is rising and present prices are the dearest during the War for hardware, iron and steel and soft goods. The men's clothing and soft goods prices, although very high, seem of less importance than obtaining the amount of goods required, as stores are getting bare of many lines through the daily absorption. As regards iron and steel Great Britain is handicapped by her high prices as compared with our local manufactured bar iron and steel. At the present time Canada makes a much better show as regards prices than Great Britain. According to the advertisements in the newspapers and on the hoardings the British manufacturers are keeping alive to the fact that they do not wish to keep out of touch with us, and immediately the prices decrease manufacturers, as anticipater in their advertisements, will soon turn out supplies for their special representatives here. Already a nice lot of luxuries have been received from England for the Christmas trade, and although very highly priced yet on such a special occasion a few buyers will come forward. As regards return cargoes for these weekly mail boats, any quantity of our products are ready to be sent oversea. In this respect it is more than satisfactory to know that the Government has put ham and bacon under the controlled list, which means that export permits have to be obtained from the Government itself. And now that profiteering committees are to be appointed it will have a salutary check on even the Government granting export permits for products and foodstuffs generally.

IRON, STEEL AND MACHINERY.

It is stated that a big London financial group is floating a company for the development of the pig iron industry at Maclear and another is talked about for the Ermelo district. Be that as it may, it is satisfactory to know that great interest is being taken in manufacturing pig iron both in the Transvaal and Natal. So far the Pretoria and Vereeniging works have had many initial difficulties, but from both places the information coming forward from month to month is increasingly promising, and in a measure the output is said to be increasing, although no figures are available. In the meantime the Transvaal is making excellent progress in the manufacture of iron and steel from scrap cast iron. Inquiries were made at the American indent houses, when it was ascertained that all orders sent were subject to confirmation at the mills, where business is very much congested on account of the difficulty of getting coal and the labour unrest. Altogether it may be taken for granted that the situation is so very much strained in America that business between South Africa and there is practically at a standstill. The latest cable states that no quotations are available unless specially cabled for, and everything depends then upon the position controlling the manufactories. The price of brass rods is 2s. 9d.; steel plates, 40s. per 100 lbs.; imported mild steel, 35s. 6d.; tool steel, 5s. 6d.; drill steel, 7½d. per lb. There is a big demand for all kinds of fencing wire and barbed wire from the farmers. In that direction also there is an excellent demand for ploughs, harrows, windmills and mealie planters. The price is not quibbled at overmuch so long as the various implements are available. A Canadian ship bringing quantities of ploughs, cultivators and harrows arrived in Durban on November 12th, therefore by the end of the month some of our agricultural stores should give a better showing.

ELECTRICAL GOODS.

Tubing, of which there is not too much on hand, has not increased in price, while lamps, together with most electrical materials, have a hardening tendency. There are still no ceiling roses in town and the obsolete low tension articles, which in the absence of the others are being sold, are not in favour for some reason or other with the Municipality. Lamps, which are selling here at 2s. each, are fetching in London 3s. 6d., which means, of course, a further rise in these in the very near future. Ceiling roses are in London 1s., which is about the same price as that obtaining here, when any are procurable. Lamp holders are also going at 1s. in both London and Johannesburg. As a matter of fact, many electrical materials are fetching at the present time double the price in London as compared with Johannesburg, but then it must not be forgotten that we have been importing electrical goods from America and Japan. Wiring also is cheaper here than in London, while, on the other hand, tubing is dearer here than on the other side. On the Commercial Exchange there has been a gradual rise in electrical goods, with the exception of lamps. Holders are to-day 14s. a dozen, compared with 9s. about four months ago. Last month, which was an average month, there was not too much call for materials, but so far this month has not been so good. Materials generally are arriving fairly freely, but the immediate outlook for obtaining regular supplies in view of the unsettled state of labour in England, is not very bright. Business as regards finishing off new residences and business premises continues excellent.

OILS AND COLOURS.

Things are excellent throughout the painting and graining trades. The prices of the ingredients are as follow: Turps, 105s. in 2-4's and about 120s. in 10-1's, as there is a lot of leakage in the last named. White lead is 85s. to 87s. 6d. per 100 lbs. and 1s. per lb. for smaller quantities. Linseed oil, raw, 95s., and boiled, 100s. Castor oil, No. 1, 110s. to 120s., and No. 3, 100s. Best salad oil, 140s.; South American, best 110s., seconds about 100s.; South African, 95s.; ordinary varnish, 13s. 6d. per gall.; lubricating and engine oils, 38s. 6d. to 42s.; grease, imported, £45 to £47 10s. per ton; local, £35; and seconds, £30 to £32. It is expected that local grease and soap will make a further advance as the great soap factories at the coast are invading our markets and buying up all kinds of fats and offals at excellent prices. Olive oil is still very scarce and it is not easy to obtain in bulk, and when available is from 30s. to 32s. 6d. per gall. A French consignment is expected shortly. Paraffin is 24s. a case, and petrol 39s., both in Johannesburg. Plate glass, as well as window glass, is getting very scarce and most of that on hand has been booked forward to regular customers. The outlook is not at all good as nothing definite as regards future deliveries can be had either from Britain or America. There is no quotable change in prices, but this is little or no criterion, as no decent sized parcels are being quoted for to arrive.

Timber and Building Material.

In a conversation with a partner in a timber merchant's business it was ascertained that the balance sheet came out on the wrong side, chiefly because of the sudden appearance of the Armistice, when quantities of stocks were under order at the tip-top prices. At the time it was thought that freights would quickly be reduced, hence quantities of timber were sold under cost; but these calculations were all upset, therefore the unsatisfactory business for the year ending June, 1919. He mentioned this because now deals are so scarce that prices have risen 2d. per ft. and a similar state of things has occurred in reference to galvanised roofing iron. These increases have created a bad impression amongst contractors, who vociferously complain of profiteering. The quotations are—deals, 1s. 7d. to 1s. 8d.; flooring, 9d. to 9½d.; ceilings, 6d. to 6½d.; iron, 24 gauge, 1s. 6d. per ft. Cape pine deals are coming into more use at 1s. 4d. to 1s. 6d. per ft. The building trade still continues buoyant, and according to the buildings in progress and the number of tenders called for new erections it is not expected that any slackening off will occur until next year.

Blue Building and Plaster Lime.

The demand for lime has been large in keeping with the building trade generally, and owing to the shortage of trucks there has been a scarcity on the reef, which is likely to continue for some little while. Furthermore, owing to the cement shortage, many contractors have been using plaster lime as a substitute, and although it takes much longer to set than cement, it has been found to be very efficient for outside as well as inside plastering. Architects and contractors have been complaining lately that several new lime works have started placing inferior products on the market. This lime is very badly burnt and sieved, and is practically useless for any purpose. These works are likely to continue in the meantime, owing to the condition of the market, but as soon as the truck position becomes easier, they may cease to exist or improve their methods. At the coast the blue hydraulic lime is being received very favourably, and, despite the high cost of railage, it is beginning to oust the shell lime, which is at present used there. It is also taking the place of cement for mortar and plaster work owing to its greater efficiency, more especially in regard to labour, as a bricklayer is able to lay far more bricks in a day with lime mortar than with cement mortar. Farmers are also beginning to realize the value of blue lime for constructing water-furrows, dipping tanks, etc., and the trade in the country is thereby increasing monthly. Owing to the increase in railage rates, the lime factories have increased their prices on the Reef by 1d. per bag, which is really a negligible amount. Blue lime is now sold at 4s. 7d. per bag and plaster lime 5s. 7d. per bag delivered on the job in Johannesburg.

The Labour Market.

The world's labour market seems calmer and a little more reassuring, as it is recognised that the cost of living must go hand in hand with increasing wages. The Government labour report for October shows an all-round slackness in the principal trades and industries. The Johannesburg inspector reports:—Mining: There is still a large number of underground workers out of employment, also a considerable number of reduction works men. This latter class will have to be absorbed in other branches of work, as the normal wastage will not provide the opportunity of employment for the excess existing, and no increase in the number of plants is in sight. Engineering remains nearly the same as last month. Men in every department are out of work, and the demand is small. Building: All building trade workers are fully employed, and this industry seems able to absorb all offering and still requires more. Clerical: Clerks and semi-clerical men still form a big section of the men registering for employment, whilst the demand for such is practically nil. Unskilled labourers and handymen in large numbers are still unemployed and will continue so until this class is provided for in an adequate and correlated manner. Total number of applications registered in the inspector's office, including juveniles, 506; juvenile section, 110; women's section, 108; total, 724. The total number for whom employment was found was as follows: Men's section, 122; juvenile, 55; women's section, 85; total, 262.

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OUR SPECIAL COAL NUMBER.

To be Published Early in December—Appreciative Letters from General Smuts and Sir Wm. Hoy—Our Special Commissioners Busy—Advice to Advertisers and Subscribers.

Good progress is being made in the collection of authoritative data for the forthcoming special coal number of the *South African Mining and Engineering Journal*, which will be published in the first week of December. Our Special Commissioners have been busily engaged in visiting the various collieries of Natal, the Transvaal and the Orange Free State, and in inspecting coaling facilities at the coast ports. Large numbers of photographs have been taken, and the issue will be replete with most valuable diagrams, maps and analyses. Since the preparation of the Special Coal Supplement was taken in hand the great American miners' strike and the prohibition of export of coal by the United States Government have intensified the potential coal trade of South Africa. Many ships have already been ordered to change their routes and coal at South African ports. Concurrently with this important development we learn of the arrival of new locomotive boilers for the South African Railways and the decision to electrify certain vital portions of the lines from the collieries to the coast and to the Eastern Rand. All this tends towards the realisation of the immense possibilities of South African coal. If any further proof be needed of the tremendous potentialities of the South African coal trade, it is to be found in two highly important letters relating to our Coal Supplement, which have reached this office. The first is from the Prime Minister. Writing from the Prime Minister's office, Pretoria, under date October 23, 1919, General Smuts says:

"I am very glad to hear that the *South African Mining and Engineering Journal* is issuing a Special Coal Number to draw attention to our coal resources in Southern Africa. These resources are unrivalled, but are as yet not sufficiently widely known. Practically the whole eastern portion of South Africa right up to the Zambesi is one vast coal field, with unlimited coal of high quality, easy to mine, and contiguous to great reserves of native labour, as well as to great deposits of iron ore and other mineral deposits. These unique resources should not only make of South Africa a country of cheap power and great industrial development, but should also become the basis of a great export trade and world-wide commerce. What we want now is publicity in order to attract the brains and the capital of the great industrial countries to the exploitation of our resources. I trust your efforts in this direction will meet with the greatest success."

The second letter, dated October 27, is from the General Manager of the South African Railways, and in the course of this Sir William Hoy writes:

"I should be interested to see the Special Coal Number you are proposing to issue, because the coal industry of this country is, I feel, not fully appreciated. There is a big future before South Africa in the coal trade, not only for export purposes but for internal and by-product purposes. Given reasonable opportunities and co-operation among collieries, and by a proper system of grading and pooling in Natal, as obtains in the Transvaal, I feel sure the coal traffic must considerably expand in the next few years. The Railway Administration will do its utmost to handle the traffic, but the prospects of obtaining material are still somewhat obscure, and I daresay we shall experience difficulty for some time in having our requirements met."

The *South African Mining and Engineering Journal* Coal Number will be published as a special and separate issue and can be ordered from the offices of this paper. The price has been fixed at 2/6 per copy. A very large amount of advertisement business has already been placed and both advertisers and subscribers are urgently advised to book their orders for copies and for advertisement space well in advance. The Special Coal Number will be a weighty and informative publication, replete with illustrations, maps, diagrams, and statistics dealing with every aspect of the South African coal trade. Its publication will, we confidently anticipate, mark the dawn of a new era in the history of South African industry. Hitherto the enormously valuable coal resources of South Africa have received very meagre attention. The glamour of our gold mines and the glitter of our diamond mines have tended to blind people to the value of the Union's coal measures; but nothing is more certain than this—that within the next few years there is going to be a tremendous development of South African coal fields. The demand for coal all over the world is unprecedented. The ravages of war have seriously disorganised the European coal industry. Many collieries in Western Europe have been ruined, and both in Europe and America the high prices of labour and materials have brought the cost of producing coal up to almost prohibitive rates. The whole world is looking for a new source where coal can be obtained at prices which are reasonable, and by far and away the largest deposits of coal which can be raised at low cost are those of the Union of South Africa.

In the near future the rolling stock of the Union's railways will be augmented by the delivery of millions of pounds' worth of new locomotives and rolling stock and within the next year or two thousands of ships will be calling at South African and Portuguese East African ports for coal. Granted transport facilities, there is scarcely a country in the world to-day which would not benefit by purchasing South African coal. If we had the necessary railway and shipping facilities we could land South African coal at Newcastle at less cost to the consumer than the consumer pays for coal from his own North of England coalfields. South African coal is at last coming into its own and we shall spare no effort to make our Special Number worthy of the momentous industrial fact which it is going to establish and elucidate.

We have decided to print 5,000 copies of this Number, and these will be distributed to every member of the House of Assembly and every member of the House of Commons; the balance will be sent to mine directors, managers, engineers, secretaries, buyers and shipping firms, specially selected persons in the Argentine Republic, India, Australia and along the East Coast of Africa. The progress and value of any country is to be gauged in terms of that country's coal deposits. No one who has any stake whatsoever in the Union of South Africa can afford to miss this Special Coal Number! A special feature of the Number will be the thorough manner in which coal mining machinery will be dealt with. The equipment of each colliery will be described in detail and also the mechanical coaling arrangements in vogue at Durban and Delagoa Bay. By-product plants will also receive attention and the growing needs of the collieries in regard to cutting, washing and by-product equipments, the general installations of the collieries (pumping, hoisting and haulage) as well as the requirements of the railways for the expansion of the South African coal industry, will be dealt with at length.

A few of the special sections are: (1) The coal resources of South Africa, with maps, statistics and authoritative views of the coal trade's future, by experts. (2) The collieries of (a) the Transvaal; (b) Orange Free State; (c) Natal; (d) Cape and Swaziland. (3) Coaling facilities at Durban and Lourenco Marques. (4) Coal mining machinery, coal cutters, hoisting and hauling machinery, electrical power plants, coal washing and sorting plants, ventilating appliances, pumps, trucks, etc., etc. (5) By-products plants. (6) Railway and shipping questions.

ENGINEERING SECTION.

HAMMER DRILLS—THEIR HISTORY, DESIGN AND OPERATION.—VII.

[By Henry S. Potter.]*

Testing of Hammer Drills.—The usual method of testing machines on this reef is to take them down the mine and test them under actual drilling conditions in one or more stopes. A considerable variation can be obtained in these results due to the following causes: A variation in the hardness of the rock, variation in gauge or hardness of drill points, and also, especially with automatic rotation machines, how the machine is held up to its work, if pressed too hard the rotation is slowed down, and if not hard enough a lot of the work is lost in the steel not being properly struck by the piston. The Cleveland Drill Company have recently got out a machine for testing Hammer Drills of the air-feed and cradle types, which is illustrated on Slide No. 41. I have no definite information regarding this machine, but it is similar to the Paynter apparatus. This machine records the number of blows per minute, the number of pounds per square inch per blow and the foot pounds of energy expended per blow, the energy of the blow being transmitted through a column of oil. I hope to obtain a full description of this machine at a later date and will then submit it as a note to the Institution. The Paynter Rock Drill Tester is described in the *Engineering and Mining Journal* of August 17, 1918. This article is well worth the perusal of members, as it deals with a considerable number of facts in connection with hammer drills which should be taken into consideration when repairing and testing drills of the types above described. Slide No. 42 illustrates a machine which is similar to one used by a well-known pneumatic tool company in America, but with the modification of an air-feed piston for holding the machine to its work, with a reducing valve so that the pressure can be varied for different weights of drills to be tested. It will be noticed that the system of testing consists of measuring the impact of a standard size punch into a piece of Swedish iron, the time allowed being generally five seconds. Also the diagram on the left-hand side of the machine, with lever mechanism connected up to the air-feed piston gives the approximate number of blows per minute. This is not a particularly accurate method of obtaining the number of blows per minute—the best method I have heard of being to run the machine in a very quiet room with a gramophone fitted with a recording stylus, and it will be found that the gramophone will record the number of taps per minute. An apparatus such as either of these machines would materially assist in the proper repair of Hammer Drills. While on this subject of testing machines, I have often noticed in the shops of the Witwatersrand that where machines are run for testing the piston is allowed to strike the front end of the machine, without having any steel inserted in the chuck. This method of running puts an unfair stress on the machine, and often tends to break away the front edge of the piston, and if this face is badly broken it has the effect of altering the timing of the valve.

Hollow Steel.—With reference to the hollow steel used in connection with these various types of Hammer Drills, it would be very advantageous if a standard specification were employed when ordering. I have had a number of samples of steel tested from different mines on the Witwatersrand and the carbon content varies from .80 to .95. It would be better from the point of view of the subsequent heat treatment of this steel if the steel was all employed of one carbon content, say, .80 to .85. (See Appendix B.) As some of our members may not be acquainted with the method by which hollow steel is made, I give below a short description of one process of manufacture. There are two systems of manufacture—the Mandrill and the Sand Core, and from examination of a large number of samples of the steel supplied to these fields, I find it is mostly made on the Sand Core process. The manufacture of this steel is as follows: A billet approximately three inches by three inches is taken, and the centre of it is drilled out. One end is carefully plugged and the hole tightly filled with a siliceous compound, the open end is then carefully closed with a steel plug. The billet is then put into the furnace, heated, and rolled out by a series of passes to the size and section required. The bar, which is then 14ft. to 16ft. long, is cropped and the bar, filled with a hard sand core, is inserted in a special holder. The centre part of this holder is hollow and is under vacuum, a joint being made round the steel by means of a rubber clamp. The small steel tube of about 5/32nds external diameter is then pressed against the sand core and air at 800 to 1,000 lbs. per square inch impinges on same. The hard sand core is broken down under a sand blast action, the loose sand being sucked away into a separator from the vacuum head. In view of the high carbon contact of the steel used in connection with Jack Hammers on this reef, this steel should receive far more careful treatment than it does, and I think that better results would be obtained if all steels were forged on one heat and then

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allowed carefully to cool down and re-heat for the hardening temperature—special care being taken when heating for annealing or for hardening not to take the same too high above what is known as the decalescent point of steel. As you will probably know, the decalescent point of any high carbon steel is that point where the steel becomes non-magnetic: the simplest method of determining this point is to heat the steel slowly and occasionally hold it under a magnet suspended near the furnace.

Type of bit on steel to be used in connection with Jack Hammer Drills.—There is a good deal of controversy as to the best type of bit to be used in connection with these machines. It is generally agreed that the fastest driller is the chisel bit, if it is properly made, and Slide 46 illustrates the method by which the most material can be obtained for forming the chisel and also it gives the correct position for the hole in the steel so that the air-blast impinges on the bottom of the hole to remove the cuttings. The chisel bit is at a disadvantage when drilling in broken or fitchered ground, when it is found preferable to use cross bits. A very interesting article on the subject was written by Mr. George H. Gilman, engineer for the Sullivan Machinery Co.—rock drill and tunnelling department; his paper being entitled "Drill Bits and Drill Steels for Metal Mining," and appeared in the *Engineering and Mining Journal*, Vol. 103, No. 19, 12/5/17, and Vol. 104, No. 4, 28/7/18. See Appendix "A." It is very essential that the orifice of the hole should be carefully located in relation to the cutting edge and should not be more than about 1½ inches back from the cutting edge in chisel bits, and should be as nearly axial as possible. Of course, with a cross bit the hole comes out at the centre of the cutting edges. It is also very advantageous if the steels are used with as small a margin of differences in gauges as possible, and I think that if ring gauges were used for testing these it would be of advantage.

Slide 43.—This slide illustrates the Wild-Barfield Electric Muffle. Not being an electrical engineer I do not propose to touch on the electrical construction of this furnace, but at the present moment experiments are being made in England with a view to designing a set of furnaces for forging and hardening rock drill steel. The particular features are that it will consist of a set of muffles—on one side the muffles being under pyrometer control. Of course, in this case the operator would have to know the correct forging temperature for any given steel he was working upon. The other side of the furnace is fitted with a pyroscopic control which operates with the decalescent or non-magnetic point of the steel. The steel is slowly heated to this temperature and cannot be taken above it. This furnace was described in *Engineering* of August 9th, 1918, and also was, I believe, referred to in an informal discussion by one of our members some months ago. The method which is now very much used at Home is a proper decalescent outfit. Slide 44 shows such an outfit and Slide 45 shows the diagram for a sample of .85 hollow steel which was sent Home to the makers of this instrument, namely, the Foster Instrument Company. It will be noted that the decalescent point of this sample of 1¼in. hollow steel is 746°C. This question of the decalescent point in steel is of considerable importance when annealing, as it has been found that in heating the steel for annealing, if it is taken to about ten degrees above this point the structure of the steel is materially improved. I think it would be found of material advantage if the steel on the Witwatersrand were periodically annealed, say, every two or three months. Of course, care would have to be taken to use the correct temperature. This temperature should in all cases be specified by the makers.

Operation of Hammer Drills.—As it may be of interest to some of our members to know the results obtained with this class of machine, though, of course, the figures which one can give vary with the conditions under which the machines are used, namely, the angle of stope, height of stope, and the hardness of the rock, number of steels in the set, etc., I give below a few figures obtained under varying conditions in the mines of the Witwatersrand and diamondiferous mines of South Africa. Roughly speaking, I have found that a Hammer Drill weighing from 30 to 32 lbs. using 30 to 32 cubic feet of free air per minute will drill five to six holes per shift 42in. to 48in. deep. By increasing the air consumption (and thus increasing the piston speed) to 39 cubic feet seven to eight holes per shift can be obtained, but it would probably result in greater cost of upkeep on the impact parts of the machine. Generally speaking, I have found in a number of tests on the Reef each machine will do the work of six to seven hammer boys. In a diamond mine such as the Premier, a 6ft. 6in. hole can be drilled in approximately two minutes, using two steels to the set, the machine weighing 35 lbs., air consumption 35 cubic feet of free air per minute, the holes being vertical. The average saving by using machines under these conditions—one machine was equivalent to the average drilling of 20 boys. In development drives in a diamond mine such as at Kimberley, forty 2ft. 6in. to 2ft. 9in. holes in the drive face in a shift by one boy. This was equivalent to the average drilling of six or eight boys. My own experience has been that if a machine weighing 38 to 40 lbs. is installed striking too heavy a blow, though it will drill faster, the operator is subject to considerable strain. One must recollect that in drilling the boy has to hold the machine continuously for five to six minutes, according to the run on the steel, usually 12in. to 14in. This renders it necessary to provide some form of support to take the weight of the machine, thus removing some of the strain from the operator, but the use of such a rig affects the dirigibility of the machine. In the early days of the use of pneumatic riveters in the ship yards, complaints were made regarding the vibration of the machine on the operator—and in this case the operator would only hold the machine for five or ten seconds. Afterwards lighter machines were evolved *designed for the size rivets they were to operate on*, and I think that similar results will be obtained on this reef by using Jack Hammers designed for the size hole that they have to drill, and I think that such a machine designed to be held in the hand could easily be standardised, weighing 26 to 28 lbs., capable of drilling five to six 42in. holes per shift, and the air consumption would be about 25 to 28 cubic feet of free air per minute.

Limitations in the use of Hammer Drills for Stoping.—My own experience has been that when the ground becomes very hard it is difficult to justify the installation of Hammer Drills owing to the cost of the installation of the requisite number of steels to the set. This would generally happen when more than five or six chisels and a hollow cross starter would have to be used for 4ft. 0in. to 4ft. 6in. holes. I think that for such conditions as these a small weight reciprocating machine with water feed, on somewhat similar lines to the machine which is being experimented with on the Ferreira Deep, would prove most suitable under these conditions.

Detachable Bits.—Many experiments have been made by the Consolidated Goldfields and other groups to evolve a detachable bit, but these mostly consisted in providing a small bit which could be used for one hole and then thrown away. I hope to give at a later stage in this paper a few slides illustrating some of the types of detachable bits and also mention some of the results obtained in connection with the experiments of the Consolidated Goldfields on the Knights Deep in 1912 and 1913. I have shown in Slide 47 a sketch of what is known as the Jenkins detachable bit. This consists of a short length of steel fastened on to a standard shank by means of a taper plug and socket. This design can be adapted to work in connection with the square hollow steel which I have previously suggested. This can be used in combination with the 1st, 2nd, 3rd and 4th steels or where the machine is finishing for ⅞in. dynamite the 1st, 2nd and 3rd steels could be made from the square section hollow steel and the last one could be fitted with a bit of this description, but using ¾in. hollow steel, the finishing bit being about 1in. across the wings. I think this bit would be improved if the tapers were machined so as to ensure that the extension piece comes in exact alignment with the shank portion of the drill steel. From the examination of the gauges as used on twelve mines on the Witwatersrand, for a 42in. hole 65 to 83 cu. in. of rock is removed; whereas with the gauges suggested in the following paragraph, and by using a piece of ¾in. steel welded on to the finishing bit a saving is effected of 15 per cent. to 20 per cent. I find that most mines are using the following gauges with their Jack Hammer drills:—

6in.	Run	Starter	1¾in.
12in.	,,	1st Chisel	$1^{9}/_{16}$in.
12in.	,,	2nd ,,	1⅜in.
12in.	,,	3rd ,,	$1^{3}/_{16}$in.

The number of cubic inches of rock removed by such a set of steels is 68.55in. Some mines use Solid + Starters, other Hollow. Personally, I prefer Hollow + Starters, as it is made from steel of the same carbon content as the other steels in the set; also I find that one can drill deeper, especially in holes of more than 25° or for foot-walling. Some mines use more + Steels in the set, especially where the ground is fitchered, and in some cases four chisels and a + Starter are used for deeper holes or harder ground, then the Starter becomes 1⅞in. or $1^{15}/_{16}$in. This combination with $1^{3}/_{16}$in. finishing steel would give $1^{1}/_{16}$in.-1⅛in. hole, necessitating the use of 1in. dynamite. If the idea were adopted of fastening in the way suggested (in Slide 47) or welding on to a length of ⅞in. collared and shanked round or square hollow steel a piece of ¾in. steel, say, 22in. long, the gauges used could be (using the same difference, *i.e.*, $^{3}/_{16}$in.):—

6in.	Run	+ Starter	1⅝in.
12in.	,,	1st Chisel	$1^{7}/_{16}$in.
12in.	,,	2nd ,,	1¼in.
12in.	,,	3rd ,,	$1^{1}/_{16}$in.

The number of cubic inches of rock removed by such a set of steels is 58.49in. This would, I think, result in each machine drilling one to two holes per shift more, or a smaller and lighter machine using less air would give the same results as the machines at present in use. It is possible that if this made-up steel were used with the heavier type of machine whose blow is apparently too much for ⅞in. round hollow, it might result in the breakage of more steel, or these machines could be reduced to a slightly lower air consumption. The same idea could also be used in connection with Air Feed Machines using 1⅛in. hollow steel, or a machine such as the Leyner using 1¼in. steel finishing for 1¼in. dynamite; in this case the steel fastened to the standard shank would be 1⅛in. diameter and the finishing bit 1⅜in. instead of 1½in. as at present used.

Air Pressure.—It would be of great advantage to these little machines if higher air pressure, such as 90-100 lbs., prevailed throughout the mines of the Witwatersrand, as then still smaller or lighter machines could be installed. I have personally had to drill in stopes where the prevailing pressure was 35 lbs. Table II. included at the end of this paper illustrates the difference in drilling speed and efficiency obtained with varying air pressures. This table has been given by the Denver Rock Drill and Machinery Co. These tests were made with machines drilling in hard granite. A further table (Table III.) is given of tests with the Dreadnaught Drill on a Paynter Rock Drill Testing Machine, showing the blow in foot pounds, number of blows per minute at varying pressures. A block has also been included in the text (Fig. P. and Slide 50) of this firm's new 70V machine; its features are the air reservoir in the chamber forming the high-pressure head of piston, and the large expansion chamber in the space at the back of the low-pressure head; the object of this chamber is to increase the mean effective pressure acting on this head during the portion of the forward stroke. It will be also noticed that this block illustrates new form of water head used in these machines, of which this firm has been the pioneer. Slide No. 51 and Fig. Q. in text describes the Ferguson oil furnace, and in view of the difficulty of properly heating steels used in connection with hammer drills, the design of this furnace is interesting. The principal feature is the provision of a primary combustion chamber, and the arrangement for additional supply of air to complete combustion of the oil as it passes into the furnace. The oil in this furnace is not atomised, but is gasified. It is advisable to use a pressure of about 5 to 10 lbs. for the oil and a fan blast of 8 ozs. This furnace operates in such a manner that the minimum amount of oxidation is produced. This is a very important item, as scale will cause more wear and tear on the dies than any other thing. It would be advisable with furnaces such as these to control temperatures both for forging and hardening by means of pyrometers. The Tregaskis Furnace, which has had a considerable use on this Reef, is similar in design to this furnace, except that it works with coal instead of oil. With reference to my concluding remarks in this paper, which has been somewhat long, but which I trust has been of interest to our members, I should like to call attention to what may be one of the future types of machines for drilling on this reef, by referring to the work done in Europe with purely rotary machines for drilling slate and sandstones. One machine I had in mind is the Kellow Hydraulic Rock Drill, which is used in the slate quarries in Wales, and also for drilling in the Rio Tinto. This machine consists of a water turbine with a hydraulic feed (a description with drawings appears in the *Iron and Coal Trades Review* of October 11th, 1918), and also the Blackett Ore-boring Machine, which is a purely rotary machine. Slide 48 illustrates the gear, and Slide 49 the complete machine. The interest of this machine to the Reef is as follows: It was invented by a Mr. Blackett and installed at the Skinning Grove Iron Ore Mines for drilling iron ore. Mr. Thorpe, who is now assistant manager of the Consolidated Main Reef, tested this machine at Skinning Grove in 1904. He informed me recently that while on the Cloverfield Mines he sent Home a block of the *hardest footwall* to be drilled with this machine. The block was sent out to him with a hole drilled right through, the drilling speed being at over a foot per minute. This result should be of interest to managers on the Far East Rand, as if this machine will drill their footwall shales it should be of interest in connection with their long drives which are mostly, I believe, driven in the footwall. Two Appendices, *A* and *B*, are included at the end of this paper: *Appendix A* gives a precis of descriptive articles of interest to rock drill users appearing in the Engineering and Mining Press during the last eight or ten years. Of course, this list is not exhaustive, but is intended to give some assistance to those who wish to study this subject in more detail than has been set forth in the foregoing paper. *Appendix B* is an extract from Geo. H. Gilman's paper on Drill Bits and Drill Steels for Metal Mining, with a view to indicating the necessity of using high carbon hollow steel in connection with Jack Hammers, and also deals with the question of using a standard specification for this steel. Any members who wish can obtain from me photographs from the slide negatives of those types of machines and apparatus referred to in the first part of this paper but not illustrated in the *Journal*.

The Government cannot be congratulated on the results of their first venture as owners of cargo-carrying steamers (remarks the *Cape Argus*). One of the vessels which they acquired, the Seattle, recently arrived, and, after discharging, was available for further service. The Government then had an opportunity of demonstrating on a small scale the utility of low freights. Instead of doing so, however, they accepted an offer from two private firms who had consignments of maize and maize meal on hand waiting export, without calling for tenders. The Seattle was chartered at £7 10s. Up to that time the Conference Lines had been charging £5 per ton for maize, but as soon as they learnt that Government were getting £7 10s., they not unnaturally increased their freights to £7. We understand the Conference Lines have since reduced the rate to £6 10s., but the fact remains that on their first entry into the shipping business the Union Government have done harm rather than good.

Swaziland Tin.

The following are the results of the operations of the Swaziland Tin Company for October: Concentrate recovered, 23.5 long tons; estimated profit (taking tin at £240 per ton), £776; add adjustments in respect of previous shipments, £458; total profit for month, £1,234

BRITISH EAST AFRICA INDUSTRIAL DEVELOPMENTS.

Local industries are being encouraged in British East Africa—particularly the establishment of a meat freezing industry, and the development of the sugar cane industry.

Cane Sugar.

An auction of land for sugar cane production, subject to the Crown Lands Ordinance, 1915, is advertised in the *Government Gazette* of 20th August. It comprises an area of 1,716 acres, and is situated on the Uganda Railway between Kibigori and Kibos, at an altitude of about 4,000 feet. Only European and Asiatic British subjects, or their certified agents, may bid and purchase, and no bid below Rs. 251,850 (£16,790) will be accepted. The terms of the lease will be 99 years, and the annual rental Rs. 671/55 (£44 15s. 4½d.). Ten per cent. of the purchase price must be paid to the auctioneer on the fall of the hammer, and the balance may be paid in nine equal annual instalments. All survey fees and cost of deeds and proportionate rental to 31st December, 1919, must be paid to the Land Officer, Nairobi, on or before 1st November.

Conditions.

The main conditions embodied in the lease include: (1) The use of the premises solely for growing, cultivating and manufacturing sugar and purposes ancillary thereto. (2) The lessees to erect and fully equip within two years of the date of the lease, a factory capable of turning out 4,000 tons of manufactured sugar per annum. (3) To have planted with sugar cane by the end of two years an area of not less than 1,500 acres, and at the end of three years and each subsequent year not less than 3,000 acres. (4) To produce during the third year not less than 2,000 tons, and during the fourth and each subsequent year not less than 4,000 tons of manufactured sugar.

Meat Freezing and Canning Industry: An Amended Offer.

In order to develop the meat-freezing and canning industry in the Protectorate the lease of an area of about 34,000 acres of land, situated between Ulu and Sultan Hamed stations on the Uganda Railway, is to be offered for tender under conditions which amend those given in the *Journal* of 19th June. The lease, subject to the Crown Lands Ordinance, 1915, will be for 99 years at an annual rental of Rs. 3,400 (£226 13s. 4d.).

Principal Conditions.

The main conditions embodied in the lease will be:—(1) That the lessee, within two years of its date, erects and fully equips a factory capable of dealing with not less than 5,000,000 lbs. (representing 20,000 head of slaughter beasts) dead weight of meat per annum. (2) That the lessee deals in the factory with not less than 1,000,000 lbs. of meat during the third year, 2,000,000 in the fourth, 4,000,000 in the fifth, and 5,000,000 in the sixth and each subsequent year. (3) That the premises are used solely for purposes ancillary to a freezing and canning factory. (4) That the lessee pays not less than the price per head fixed by Government for cattle bought directly or indirectly from natives. All survey fees and cost of deeds must be paid by the successful tenderer with the proportional rental to 31st December, 1920, on or before the 1st February, 1920.

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Notes and News.

Frank Smiths.

A full report of the special meeting of the Frank Smith shareholders in London, whereat the scheme to reconstruct the company was carried unanimously, will be found in this issue. The company will now become a purely South African one, and as the chairman very clearly showed by a reference to the previous results, its success is now assured.

* * * *

Victory Monarch.

The secretary of the Victory Monarch G.M. Co., Ltd., writes: "I have received the following particulars from the mine of a trial crushing of 510 tons: Recovery over plates 286 ozs., plates not scraped, 10 tons of concentrates left for regrinding. Sands not treated. The manager informs me that he hopes the plant will crush at full capacity by December 1."

* * * *

African Oil Corporation.

The secretary of the African Oil Corporation, Ltd., states that the following are the salient features of the consulting engineer's report, dated November 18, 1919: Work was commenced on the company's properties early in September, and has been pushed ahead with considerable energy. The shale has been proved for a distance of three miles by means of extensive cuttings into the hillside. The cuttings for the most part disclose a complete section of the shale of an average width of five feet. Assays made from the various faces exposed in the cuttings give an average value of thirty gallons of oil per ton over a retorting width of four feet, the allowance in wastage in mining being estimated at 20 per cent. This value is equivalent to 60s. per ton on the basis of pre-War selling prices, and should show a profit of 35s. per ton without any allowance being made for the much higher prices obtaining at present. The prospecting operations disclose the existence of a much larger area of oil shale than was originally assumed to exist. A survey with a view of deciding the plan of permanent development is about to be made.

* * * *

Mining and Aviation.

A French mining company will, it is stated in an exchange, use aeroplanes to locate and open up mines in a concession of 400 miles in Africa. This is in accordance with the modern idea, and the progress of the undertaking will be watched with much interest. In the first place the company's engineers will endeavour to locate paying deposits, the aeroplane enabling them to keep in daily touch with central quarters, and as the mines are discovered the full aeroplane service will be used in the transport of miners and machinery to enable the quick development of the mines. Even though the mines are scattered over the whole area, the inspection will be comparatively easy with the aid of the aeroplane, and it will be possible for the directors and even shareholders to view the properties at frequent intervals. That the aeroplanes will prove a valuable adjunct to mining development is a foregone conclusion, and no doubt other mining companies will follow in the enterprise.

* * * *

Boring on the Southern Van Ryn.

We have received from Mr. Chas. J. Tutt, consulting engineer of the Southern Van Ryn Reef G.M. Co., Ltd., the following information as to boring on that property: No. 17 borehole situated at the southern portion of the property has intersected the Van Ryn Reef resting on a shale footwall at a depth of 280 feet. The following is a section as exposed in the borehole of the Van Ryn series: At 247 ft. 4 in., 3 ft. 4 in. reef matter; at 250 ft. 8 in., 9 ft. 4 in. reef; at 260 ft., 1 ft. schist; at 261 ft., 5 ft. 9 in. quartzite; at 266 ft. 9 in., 4 in. reef; at 267 ft. 1 in., 11 ft. 11 in. pebbly quartzite and reef matter; at 279 ft., 1 ft. reef on shale, very highly mineralised. The drill is now in shale at a depth of 304 ft. Assay values will be published as soon as they are known. Mr. Tutt intends taking up his residence on the Southern Van Ryn property in the near future.

The Sheba Scheme.

In our last issue we gave particulars of the Sheba reconstruction scheme. The company, it will be remembered, owns a large property in the Barberton district of the Transvaal, the original English company to deal with which was floated so far back as 1887. A number of dividends have been paid, the highest having been 20 per cent. for 1896-7 and the last 10 per cent. for 1914-15. Early in 1918 it will be remembered that the property was closed down owing to exhaustion of working capital, and at that time the ore reserves were estimated at only 58,000 tons, which, however, had the fairly satisfactory average of 7 dwts. gold per ton. There were then indications of payable ore again being encountered when normal conditions prevailed and arrangements could be made to provide the necessary funds for development purposes. The present proposal is to form a new company with a capital of £300,000 in 5s. shares and to offer one of these, credited as 4s. paid, in exchange for every existing share. The scheme has been successfully underwritten for a commission of 5 per cent. upon the liability of 1s. per share, and accordingly it is estimated that the new company will commence business with a cash working capital of about £50,000.

* * * *

Rhodesian Company Results.

Annual reports have just been issued by two of the principal Rhodesian mining-finance companies. That of the Gold Fields Rhodesian Development Company shows a net profit about £34,000 less than before, but the annual dividend is maintained at 1s. per share. The balance sheet at 31st May last shows an increase in the liquid resources, and a decrease under the headings of investments and mining properties and farms. The latest schedule of the company's principal investments includes only a dozen items, as against 18 in the previous report, those which have disappeared being holdings in Chicago-Gaika, Gaika, Kimberley, Thistle-Etna, Transvaal and Rhodesian, and Willoughby's Consolidated Companies. The present schedule, however, still includes over 1,000,000 Antelope shares, over 81,000 Eldorados, and 342,000 Selukwe-Columbias. The last-named concern has now gone into liquidation and the other two look like joining it before very long. The Willoughby's Consolidated report for 1918 shows a profit of £15,600, as compared with £4,000, but "bad debts, London," amounting to £24,000, have been written off, and this has wiped out the £10,000 which was held in reserve and reduced the credit balance to just under £11,000. Once again the shareholders have to go without a dividend, and the prospect of their receiving some return on their investment still seems remote. There are two classes of debentures in front of the share capital. These debentures are gradually being redeemed, but there is still over £23,000 outstanding. In the balance sheet, "Shares in subsidiary and other companies" figure for over £212,000, but the market value is not stated.

* * * *

Aid for the Prospector.

In moving a resolution urging the Government to provide funds for the training and maintenance of suitable returned soldiers and phthisis men as prospectors, Mr. H. A. White, member of the Council of the Chemical, Metallurgical and Mining Society, pointed out that in the Pretoria district alone the Government derived a direct revenue averaging £80,000 per annum for the last ten years from its mineral resources, which at the same time provided means for great agricultural development. Mr. White continued: In the G.M.E.'s report for 1917 the Inspector of Mines for Natal says that practically no prospecting is going on, and that mineral deposits should not be neglected in the way that is being done at present. In the report for 1918 the same gentleman returns to this point and says: "If competent prospectors were employed, I am sure that success would attend their efforts." The Mining Bureau of Vancouver has recommended to the Minister of Mines that returned soldiers with a knowledge of prospecting should be employed under the district engineers by means of a fund provided for that purpose, the Government to share in the profits of discoveries made under that policy. The matter is also being considered in the United States and in Australia, while Major C. S. Goldman, well-known in this country, who is now settling in British Columbia, advocates the training of prospectors by large mining companies and the exploration of the country by these men in organised parties. There can be no real doubt of the benefits to be derived.

* * * *

Cost of Living Figures.

In a preface to his supplement to the "Half-Yearly Abstract of Statistics," Mr. C. W. Cousins, the Director of Census, says that they represent in summary form the index and other relative figures indicating up to the end of September, 1919, the comparative cost of living in the nine principal towns of the Union and in the seven areas into which the Union has been divided for the purposes of these statistics. The figures in the first series of tables represent expenditure on food, fuel, light, and rent; and in the second series expenditure on food only. The question of the cost of living in the Union, he adds, is clearly a most serious one at the present time, and it will be seen that the figures given herein indicate that never has the cost stood so hfgh as it has done in the last quarter. Nevertheless many persons are apt to draw exaggerated conclusions as to the actual percentage increases in various localities and communications published in the press give examples thereof. It is not sufficiently realised that the true average takes into account many items in which increase in cost is not so strongly marked as in others, and that it represents the expenditure of a whole community, some sections of which are less affected than others. The system of price collection utilised is sufficiently thorough and exhaustive to give every confidence that the figures published, representing as they do about two-thirds of the expenditure of a normal household, are to that extent both accurate and reliable. Nevertheless, as regards the balance of expenditure, i.e., one-third, it may very well be that the percentage increase of expenditure is greater than that involved in the purchase of food, fuel, light, and rent only; and therefore that the actual purchasing power of money at the present time is even less to that extent than is indicated in the figures published in the Census tables.

* * * *

The Sub Nigel.

The following is a summary of the operations at the Sub Nigel for the quarter ended September 30: The development footage accomplished during the quarter amounted to 4,576 feet, of which a distance of 3,796 feet was advanced on reef. 3,450 feet were sampled, of which 1,190 feet gave 11·8 dwts. over a stoping width of 42 inches, whilst the average of the balance of footage sampled was not within the pay limit. Tons milled 31,000. Working profit (including sundry revenue) £20,110, less, however, £3,468 appropriated during the quarter in respect of special expenditure due to War, contributions to miners' phthisis compensation fund, additions and renewals fund, Government taxation, etc. Gold in reserve, £12,880. Up to the end of October the new vertical shaft had reached a depth of 2,360 feet, and the engineers anticipate meeting the reef measures at any moment. The character of the ground at the bottom of the shaft is normal, and undisturbed by dykes. The average number of boys employed during the quarter was 1,249 as against 1,269 previously, the number employed at date being 1,059 or 74·7 per cent. of the complement. In view of the importance to this company of maintaining rate of development the board is of opinion that during the shortage of native labour this work shall be given priority over mining of ore for current working. The published results do not include the price now being obtained under the new arrangements for the free disposal of the gold shipped since July 25 last. The gold so far sold is equal to about 1½ months' output of the Witwatersrand and has realised a premium of approximately 16 per cent. Any increased profits obtained by the companies will be published quarterly after receipt of account sales. The new phthisis legislation which came into force on August 1 is estimated to cost the company an additional £4,000 a year. On

November 6 the reef was struck in the new vertical shaft at approximately 2,382 feet, and gives an average, over 14 sections of reef sampled, of 13·9 dwts. over 9·2 inches.

* * * *

A New Mining House.

The National Mining Corporation, Ltd., has been registered in London with a nominal capital of £3,000,000 in £1 shares. The objects are: To carry on the business of financiers, promoters, owners of mines and oil properties, explorers, miners, metallurgists, etc. The first directors are: Messrs. H. Guedalla, managing director of Imperial and Foreign Corporation, Ltd.; J. A. Agnew, director of Burma Corporation, Ltd.; F. W. Baker, chairman of Mexican Corporation, Ltd.; S. Christopherson, director of New Consolidated Goldfields, Ltd.; E. M. Edgar, partner of Sperling & Co., merchant bankers; A. S. Elmore, managing director of Chemical and Metallurgical Corporation, Ltd.; F. A. Govett, chairman of Lake View and Oroya Exploration, Ltd.; B. Kitzinger, director of National Bank of South Africa, Ltd.; W. McDermott, chairman of Consolidated Mines Selection Company, Ltd.; H. Strakosch, manager of Union Corporation, Ltd. All the above are British subjects, but B. Kitzinger is of German origin (naturalised in 1909) and H. Strakosch is of Austrian (Czecho-Slovak) origin (naturalised in 1907).

* * * *

Lace Props.

The report of the directors of the Lace Props, to be submitted to shareholders at the thirteenth ordinary general meeting, called for Friday, the 28th day of November, 1919, shows that in August, 1918, shareholders agreed, at special meetings called for that purpose, to the reduction of the issued capital from £255,000 to £127,500 by the issue of one new share in the reconstructed company for every two old shares held, and the reduction took effect from 5th September, 1918. Steps were then taken, in accordance with the scheme of reconstruction passed by the shareholders at the meetings referred to, to increase the capital to £255,000 by the creation of 127,500 new shares, which were offered to shareholders at par, and the issue guaranteed at the same price by the Anglo-American Rhodesian Exploration Company, Ltd. A further 127,500 shares were offered to shareholders for a period of two months, which expired on 4th November, 1919, at 22s. 6d. per share, and this issue was likewise guaranteed at that price by the same company. The directors have authority to increase the capital up to a total of £1,500,000 by the creation of a further 1,117,500 shares of £1 each in order to provide for the options given to the guarantors under the reconstruction scheme, should such options be exercised, viz.: An option to 5th March, 1922 (viz., 3½ years) at 22s. 6d. per share on 510,000 shares; an option to 5th March, 1924 (viz., 5½ years) at 27s. 6d. per share on 607,500 shares; total shares under option, 1,117,500 shares. Summarised the position as to the capital is as follows: Issued, 255,000 shares of £1 each; shortly to be issued, 127,500 shares of £1 each; under option, as above, 1,117,500 shares of £1 each; total authorised capital, 1,500,000 shares of £1 each. The property now consists of the following farms: (1) The freehold farm Vlakfontein No. 26, district of Heidelberg, in extent 3,554 morgen 30 square roods; (2) the freehold farm Droogefontein No. 447, district of Pretoria, in extent 5,419 morgen 44 square roods. It will be observed that the following item, hitherto included in the description of the company's property, disappears, viz., the mineral rights of the three farms comprising Spaarwater No. 154, district of Heidelberg, the total extent of which is 5,718 morgen 572 square roods, divided as under:—Farm No. 1, in extent 1,906 morgen 351 square roods; farm No. 2, in extent 1,905 morgen 460 square roods; farm No. 3, in extent 1,906 morgen 361 square roods. The above rights have been disposed of to the Spaarwater Gold Mines, Ltd., a company formed during the year for the purpose of taking over such rights. The consideration received was 251,994 shares of £1 each, fully paid, in the Spaarwater Gold Mines, Ltd., and these shares have been taken into the books of the company at £147,624 9s. 8d., that being the total cost to this company of the Spaarwater mineral rights and the expenditure incurred by this company on the farms.

TOPICS OF THE WEEK.

THE NEW SPIRIT IN INDUSTRY.

The best augury for the future of industry in this country is what Mr. Julius Jeppe this week well called "the new spirit" of co-operation between employers and employed manifested in the statesmanlike agreement come to in the printing trade. "With the new spirit," said Mr. Jeppe at the S.A. Townships meeting, "that has recently been shown on the part of employers and employed in the Industrial Conferences that have recently been held in this town, and which, I trust, will long continue to permeate the ranks of all classes in this country, I see no reason why South Africa should not from now onwards advance very considerably in material prosperity in every branch of development." Mr. Jeppe went on to illustrate how needful that spirit was at this juncture. "The conditions arising out of the great War," he said, "now fortunately at an end, have given an impetus to industrial and manufacturing activities which, I am sure, by the exercise of energy and efficiency on the part both of employers and workers will become permanent, to the great advantage of the country generally; and the same causes have brought additional wealth and prosperity to the farming population, a position which, by scientific methods—good organisation and hard work—I feel assured that they will retain. In this connection, it is worth remembering the very great advantage this country possesses over others, not only in mining, but in all forms of industrial production, owing to the enormous reserves of coloured labour in the country. The only thing this country wants to go ahead, and to go ahead quickly, is peace, political and social peace; after this devastating War and the ruined condition in which it has left the producing power of Europe, the first country which settles down to production of all kinds with all its energy and unabated attention will reap the greatest and the most permanent benefit." Mr. Jeppe thus really says in other words what General Smuts and Mr. Malan have already said, and what most sensible people are thinking. Evidences of industrial progress are everywhere around us. Gold, diamonds, coal and base metals are booming. Real estate is realising record prices. Local industries of all kinds are flourishing. The field for the profitable investment of capital in this country never looked more promising, and never has the opportunity seemed more propitious for industrial expansion. The one thing lacking is the more general manifestation of "the new spirit" to which Mr. Jeppe referred. That the near future will see it made more manifest is our earnest hope and desire. The re-assembling of the adjourned National Congress at Pretoria and the forthcoming conference between employers and employed in the mining industry should provide opportunities for the display of that spirit, and on the results of those forthcoming meetings, needless to state, much of the future of the country depends. For our part, we are confident that the great good sense of all concerned will ensure satisfactory settlements being reached on all the questions at issue. To its credit be it said that the printing trade of South Africa has this week set a forceful example and a timely example to the rest of the country and the sister industries. The lesson will doubtless sink in during the interval before the projected meetings of masters and men in the mining and other industries. If so, we may hope for a speedy and permanent realisation, as far as this country at any rate is concerned, of the ideal embodied in the phrase, "the new spirit." "Our salvation, employer and employed," said Sir Evelyn Wallers on a memorable occasion, "lies in the apparently simple, yet really very difficult, work of building, piece by piece, with great persistence and infinite patience, upon the basis of steadily developing mutual understanding and desire for mutual goodwill. Let us make no mistake about it. Any suggested panacea of our troubles, whether it comes from employer or employed, that leaves out this essential factor will never prevail; and it is just in so far as Capital and Labour in this industry have realised this great truth, and the measure in which we have jointly carried it into effect, that we shall find the reason for any degree of improvement in our industrial atmosphere that may have been achieved."

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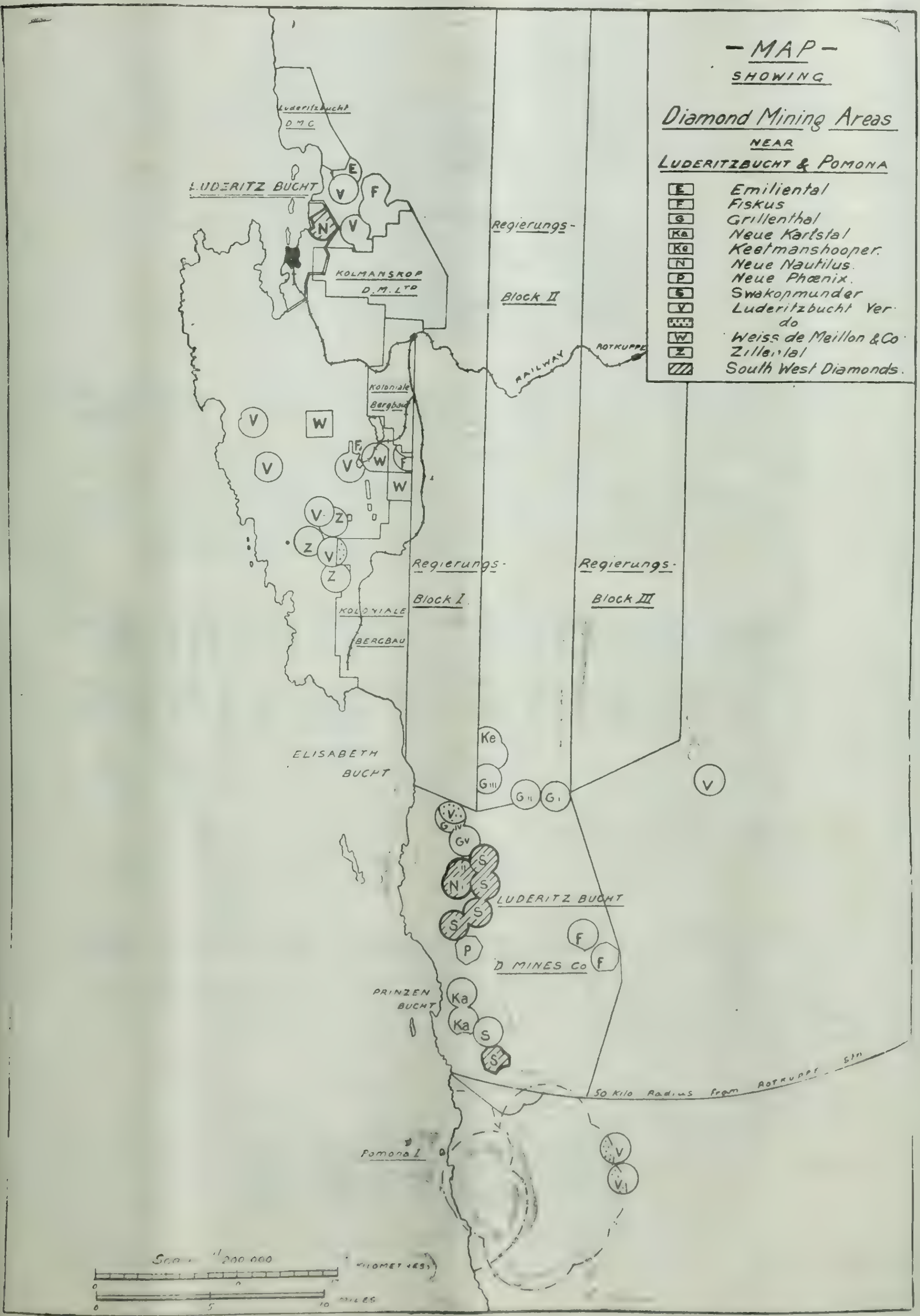

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394

SOUTH AFRICAN INTEREST IN THE FUTURE OF OIL.

A "Burning" Question—British Anxiety to Ensure Supplies—Are Existing Sources Becoming Exhausted?—The Shell Group.

THE future of oil and its bearing upon the nascent industry of oil shale extraction in South Africa has, in more than one sense, become with us to-day a "burning" question. It is noteworthy that Great Britain at the present time has a big hold on the world's supply of oil, and is likely to increase this in the near future. Those interested in the subject cannot do better than peruse a somewhat remarkable article in the latest number of *Sperling's Journal* by Mr. E. Mackay Edgar, entitled "Britain's Hold on the World's Oil." In this the writer points out that a generation ago the products of petroleum, which to-day are the backbone not only of the oil industry but of a long list of other industries, were regarded as so much waste, but now a vast new world of mechanical possibilities, springing from the internal combustion engine, revolves round the supply of oil, and it is scarcely an exaggeration to say that if there were enough of it to be had no one would burn coal. "We are only just now on the threshold of the oil area." The writer proceeds to show how in the past America has frittered away her resources in this respect and foresees the time when the United States, once the chief producer of oil, will have to import from other countries. Already, indeed, they are importing oil from Mexico, and it is that country and South and Central America that afford the natural openings for America's expansion in the field. The overwhelming majority of the petroleum deposits of the Central South American States are held by British subjects and will be developed by British capital. The Alves group, whose holdings encircle practically two-thirds of the Carribean Sea, is a wholly British group, working under arrangements that ensure the perpetual control of its undertakings in British hands. In this connection one must refer to the greatest of all oil organisations—the Shell group. Through its associated and subsidiary companies it has a paid-up capital estimated at £100,000,000, with a total output that cannot be much less than 12,000,000 tons a year, or one-sixth of the entire production of the world, while when the industry revives in Russia and Roumania, in both of which countries the Royal Dutch companies were by far the largest producers before the War, and when the Mexican wells are free to expand to their maximum capacity, the Shell group, a British corporation, will be in control of not far short of a fourth of the world's supply. "Ably financed and superbly organised, with cash resources that at the end of last year were reckoned at £25,000,000, and with a complete chain of connections from the wells to the consumer, the Shell group owns exclusive or controlling interests in every important oilfield in the world. There remains the question of whether the world's supply of oil will be sufficient for the world's needs, in which connection it must be remembered that the potentialities of some countries which already contribute largely to the world's output have by no means yet been ascertained. Dr. Armstrong, Emeritus Professor of Chemistry at the City and Guilds College, South Kensington, in a long letter to the *Times* recently, said that the oilfields of the world cannot be long lived at the present rate of extravangant use. The American oilfields are all but exhausted, and to feed not only the Navy, but also the mercantile marine, with oil will, he says, be impossible, while in view of the early exhaustion of oil supplies, far, far sooner than of coal, we should economise in oil rather than seek to extend and develop its use. This statement, coming from a learned professor, carries weight, but as it is based mainly on theory, it is not quite convincing. It apparently leaves out of account the possibility—we should be inclined to say the certainty—of vast new fields being discovered as time goes on, so that as one field tends towards exhaustion it will be replaced by a new one, though obviously if the use of oil increases, and it certainly will, the development of new areas must be effected more rapidly than it was in the past, and this we are quite prepared to see. To quote from the article in *Sperling's Journal*: "The whole earth is being ransacked for the precious fluid. Skilled geologists, backed by unlimited capital, are at this moment cutting their way through dense bush, broiling on barren deserts, freezing in the Arctic zone, exploring rugged mountains and far-flung prairies, seashore, plain and valley, that the world may be fed with oil."

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A NEW SOUTH WEST AFRICA ENTERPRISE.

The prospectus of a concern styled "South-West Explorations, Ltd.," is in "private circulation." The capital is £35,000, divided into 35,000 shares of the nominal value of £1 sterling each, allocated as follows: To provide working capital, 5,000 shares; to purchase of rights, 20,000 shares; reserve, 10,000 shares. The vendors reserve to themselves the right to take up 5,000 of the reserve shares at par. Sharholders have the right to take up the remaining 5,000 shares, at par, *pro rata* to their holding. The directors are T. C. Alison, Globe Foundry, Johannesburg, and James Arthur Roberts, Johannesburg. The objects of the company are set forth in the prospectus as follows: To exploit certain rich finds and to explore a certain district or districts in the South-West Protectorate already visited and known to be of great mineral value. It is the intention of the directors of South-West Explorations, Ltd., to float subsidiary companies on each and all the properties acquired by this company. The basis on which each of such subsidiary companies will be floated will be that shareholders in South-West Explorations, Ltd., shall receive two shares in the capital of each subsidiary company on each one share in South-West Explorations, Ltd. Such shares in the subsidiary companies will, of course, be received by the shareholders of South-West Explorations, Ltd., actually registered at the time of the distribution of shares in the subsidiary companies, of which distribution due notice will be given to shareholders. The company evidently does not believe in wasting time, for the following subsidiary flotations are in contemplation: Tin property in South-West Protectorate; copper property in South-West Protectorate; sulphur property in South-West Protectorate; diamond property in South-West Protectorate.

Diamonds for Industrial Purposes.

Cape and Brazil diamonds are used for many industrial purposes and the preparation and mounting of such gems for industrial use has been largely developed in the United Kingdom during the War. Amongst other uses, the following are worthy of particular notice: (1) For truing abrasive wheels used in precision grinding by engineers, etc.; (2) for glass cutting; (3) for drawing wire filaments of all kinds, such as for electric lamps, for aeroplane wire, etc.; (4) for turning vulcanite, as used by makers of magnetos and other electric machinery; (5) for slitting optical lenses for binoculars, etc.; (6) for shaping jewels for instrument bearings; (7) for mining drills; (7) for writing and etching on glass and metals.

Nitrogen from Air.

As soon as the industrial outlook becomes more settled, the Nitrogen Products and Carbide Co., Ltd., London, contemplate the establishment in West Cumberland of extensive works for the carbonisation of coal, the fixation of atmospheric nitrogen, and the manufacture of a very large range of products which can only be economically handled on a large scale in the vicinity of coal mines. The company, which already owns big works at Odda, Norway, is one of the world pioneers in the fixation of atmospheric nitrogen, and if their present project matures they will be the first to instal a commercial plant for this purpose in the United Kingdom.

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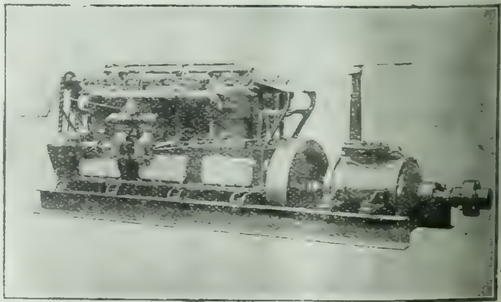
Arc Welding Sets, Compressor Sets, Salvage Pumps, Auxiliary Ships' Lighting, Marine and Stationary Sets, Switch Boards, Country House Electric Lighting, 5-h.p, to 450-h.p.



Aster Engineering Co. (1913) LTD.
Wembley, Middlesex.

A REVIEW OF THE SOUTH AFRICAN MINING AND ENGINEERING TRADE.—I.

What Happened in the War Period—Possibilities of the Market for British Goods—American Competition.

The following review of South African trade is taken from the valuable annual report of Mr. J. L. Wilson Goode, H.M. Trade Commissioner at Capetown:

Iron and Steel: Bar, Bolt and Rod.—The South African demand for these articles will be on a large scale. For some time bar iron has been manufactured and rolled in increasing quantities in South Africa, the output having been curtailed solely as a consequence of the limited amount of scrap and pig iron obtainable, and by the shortage of necessary machinery for working purposes. Quite recently extensive deposits of iron ore have been discovered. The progress of South African production of iron will be stimulated by the knowledge that coal can be obtained without difficulty and at cheap rates, and with the establishment of blast furnaces near Johannesburg the shortage of pig iron will be steadily removed.

Galvanised and Corrugated Iron.—It is believed that this market is capable of absorbing considerable quantities of these articles. It is expected, however, that there will be a reduction from the pre-war quantity owing to the increasing utilisation of tiles of local manufacture for purposes for which galvanised iron was almost exclusively used.

Pipes, Piping and Fittings.—The quantity of iron and steel pipes, piping and fittings imported into South Africa has steadily decreased during the period of hostilities. Before the War the United Kingdom supplied considerably more than half of the total requirements of this country. Germany was the next largest source of supply, the imports from that country amounting to about 25 per cent. of the total quantity imported. The supplies from the United States of America did not exceed 10 per cent. of the total. During the year 1917 the quantity imported from the United States of America was about three-fifths of the quantity imported from the United Kingdom, but Canadian imports, which commenced in 1914, have since increased with unexpected rapidity.

Drill Steel.—The imports of this material into the Union are almost exclusively for consumption by the mining industry. It is estimated that the average annual consumption by the gold, diamond and coal mines from South Africa, based on a period of three years, is equivalent to about 4,500 tons per annum. The quantity consumed by other industries is so small that it cannot be said to be of any real importance. Two kinds of drill steel are used on the mines, namely, solid drill steel and hollow drill steel. The use of hollow steel is practically an innovation, which was introduced with the special object of allaying dust. The machines in connection with which this material is used are constructed in such a manner that water can be forced through the hollow in the centre of the steel against the face of the rock. By this means the dust evil, which is a cause of miners' phthisis, is to a great extent prevented. The first shipment of hollow steel to this country was made from Sweden, and considerable portions of subsequent importations have originated from that country. During the War, however, Sheffield manufacturers acquired a considerable knowledge of this class of manufacture, and have gradually overtaken the progress made by Swedish manufacturers. American supplies have also entered the market, and whilst it is impossible to obtain definite figures, it is estimated that about one-half of the orders placed by the Transvaal Chamber of Mines for hollow steel during the last two years has been executed by American manufacturers, and the remainder has been placed with British manufacturers. Had not the introduction of hollow steel been rendered necessary by conditions underground, it is probable that United Kingdom manufacturers would have continued to hold the South African market for drill steel. Until the outbreak of War, practically no solid steel other than British, except a very small quantity from Sweden, was imported into the Union. An increasing proportion of hollow steel is, however, anticipated in the future, and it is thought that American manufacturers will endeavour to retain the hold upon this trade which War conditions have assisted them to secure. In endeavouring to assess future requirements, it is important that the present position of stocks should be considered. On the 1st September, 1918, there was in stock on the various mines in the Union approximately 5,000 tons of solid drill steel, a quantity which represented rather more than twelve months' consumption of all drill steel. The proportions of solid and hollow drill steel then being used were approximately: Solid, 55 per cent.; hollow, 45 per cent. If these figures are accepted, the stock of solid steel will represent approximately two years' consumption. But apart from this, various steel merchants in South Africa have large stocks of solid steel in addition to those stocks held by the mines. Figures as to the exact quantities are not available, but a rough estimate may be put down at about 3,000 tons, or a further 12 to 18 months' supply. It would appear, therefore, that there is sufficient solid steel in the country to fulfil the demands of the industry for a period of three years without importing any additional supplies from oversea. The position in regard to hollow steel is entirely different. There was no accumula-

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tion of stocks when the War broke out, and towards the close of 1918 it was estimated that there was no more than six months' supply. To summarise the position in regard to drill steel, it is thought that there will be practically no demand for solid steel for a period of three years, but that there will be a demand for about 2,500 tons of hollow drill steel per annum, for the supply of which United Kingdom manufacturers will have to face American competition.

Plate and Sheet, Rolled.—During the year 1913 the total quantity imported into South Africa was 294,983 cwts. as compared with 51,263 cwts. in 1918. Prior to the War the imports from the United Kingdom were far in excess of those from other countries. Belgium was second on the list for plate rolled iron and steel as well as for sheet rolled iron and steel, but, whilst the imports of the former from Germany were nearly as large as the imports from Belgium, they only represented about one-third of the imports from Belgium of sheet rolled iron and steel. Since the War the quantity imported from the United Kingdom has been considerably reduced, but the quantity imported from America has shown a marked increase.

Agricultural Machinery.—The imports of agricultural machinery have decreased enormously since the outbreak of hostilities, which is shown by the fact that, although values have considerably increased, the value imported in 1913 was £209,212 as compared with £84,916 for the year 1918. The pre-War imports from the United Kingdom and the United States of America were about the same, but during the War supplies from America, although reduced, have been considerably greater than the supplies from the United Kingdom. In the case of this class of machinery, it must be considered that practically every line imported into South Africa is covered by an agency arrangement, with the result that American machinery has continued to be imported by agents and others who have supported the American market for a period of years. The result is that firms who have hitherto been holding agencies for the goods have found themselves unable to obtain supplies from other countries, when exports from the United Kingdom were discontinued. These agency arrangements have a tendency to keep business in the same channel, and it is thought, therefore, that after the War the old sources of supply will be resumed. In the years immediately preceding the outbreak of War, agricultural machinery of United Kingdom manufacture was getting a slightly stronger hold on this market, and, provided United Kingdom manufacturers increase their efforts to secure business after the War, it is probable that they will obtain a larger share of the trade than during pre-War conditions. It is, however, advisable to point out that there is some difficulty in making changes, owing to the fact that firms who have been stocking machinery for years and have large stocks of spare parts find it inconvenient to change their sources of supplies. This applies more particularly to the supply of spare parts, which is a fairly lucrative business. Turning to the various machines which are placed under this category, it may be mentioned that prior to the War America supplied the largest quantity of heavy binders, mowers and rakes used in South Africa. Canada was the next largest supplier of these articles. America also supplied the largest quantity of ploughs and harrows, Germany held the second place, and the United Kingdom and Canada shared the third. The supplies during recent years from the United Kingdom have been discontinued, and at the present time there is a great shortage and consequently a large demand for British supplies of machines and spare parts. In view of the wider cultivation which is becoming increasingly evident throughout the country, the future demand by South Africa is likely to offer every encouragement to British manufacturers.

(To be continued.)

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Low Air Consumption. It drills 30% faster than any other drilling machine.

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VICTORY MONARCH G.M. CO., LTD.

A Resuscitated Venture with Good Prospects—Sound Exploitation Policy.

THE great advance in the price of gold has been the means of directing attention to auriferous deposits in all parts of the world, and it is interesting to note that in several parts of South Africa old mines are being resuscitated with every prospect of success. One of the most interesting of these revivals is the Victory Monarch Gold Mining Co., Ltd., which was promoted locally by W. R. Levin & Co., Ltd., early in the present year. This proposition has now reached a stage of development which is exceedingly satisfactory, and it is moreover well equipped with machinery. The subscribed capital of the company is only £52,250, and great credit is due to the promoters of the company and to the present board of directors as well as to the technical advisers of the corporation for the manner in which the company's property has been exploited. The Premier Tati Monarch Reef was discovered so long ago as 1887 and the mine has at various times produced large quantities of gold and has gone through many vicissitudes. Mr. E. Thomas Temby, F.G.S., M.I.M.M., who examined the property for the present company, dealt at great length with the history and prospects of the company in a report dated December 20th, 1918. Mr. Temby's advice and statements were conservatively expressed, but he advocated an eminently sound and businesslike policy of exploitation and the company appears to have successfully carried out this policy. The present position of the venture is well brought out in the report of the manager, dated Francistown, November 8, 1919. In the course of this report, Mr. Woodley writes:

You have 12 blocks of claims, which is equal to 120 Rand claims, and they are pegged so as to give 9,000 ft. on the strike of the reef. The blocks of claims which have been opened up are the Francis, Main, Central and Amelia, 50 per cent. of the reef on the strike being exposed and sunk on, and 75 per cent. of the reef is found payable to an average depth of 175 ft. Treating these blocks of claims individually:—

Francis Block.—A main shaft, 13·5 ft. x 7 ft., has been sunk and timbered to a depth of 150 ft. off reef and crosscuts put in to cut the reef. At No. 1 level reef was intercepted giving an average value of 8·9 dwts. over 42 in. No. 2 level reef was intercepted, giving an average value of 12 dwts. over 44 in. There is 600 ft. of strike and the shaft being sunk about the centre. Shaft sinking is still in progress and we expect to cut the reef again at 230 ft. Nos. 1 and 2 levels have been opened up by drives and winzes, giving a developed tonnage of 15,000 tons of 7 dwt. ore. I have every reason to believe that the reef in this block will continue down to 500 or 600 ft. in depth similar to the reef in the Main mine, which is only 200 ft. away and on the same strike. This being the case 70 per cent. of the ore developed would be payable, giving about 52,000 tons averaging 6·5 dwts. This block has machinery and equipment to the value of £1,500 and is capable of handling quite a large tonnage.

Main Block.—A 14 ft. x 7 ft. shaft has been sunk and timbered off the reef to a depth of 500 ft. Crosscuts are put in to intercept the reef at the different levels. There is a considerable amount of development done, opening up 60,000 tons of ore averaging 6·8 dwts., and there is still quite a lot of development to be done which should open up 100,000 tons of payable ore. At the 500 ft. level the reef is 6·5 dwts. over 104 in., and there is every indication that the reef continues. The shaft is well equipped, having a 65 ft. steel headgear and hauling engine capable of handling 300 tons of rock per 24 hours.

Central Block.—This block is on the north side and adjoins the Main Block, being on the same strike of reef. 200 ft. of shafts have been sunk, giving very encouraging values. No. 21 shaft at 70 ft. the reef averaged 9 dwts. over 72 in. Nos. 25 and 26 shafts have been sunk 130 ft. in all, averaging 7 dwts. over 30 in., and from the look of this reef and taking the strike into account a considerable tonnage should be available from this block.

Amelia Block.—This and the Central Block adjoin one another. Three shafts are sunk on the same strike of reef to an average depth of 110 ft., the reef being opened up for 600 ft., averaging 36 in. of reef at 8 dwts. From this 16,500 tons of ore is available, and a further distance of 400 ft. on this reef is still to be opened up. This reef is similar to the Main Block and should go down to an equal depth.

Taking now the tonnage in the three blocks, viz., Francis, Main and Amelia, leaving out the Central for further development, we have a total tonnage of 91,500 tons averaging 6·85 dwts. with a recovery of 6·3 dwts. Further, there is another 250,000 tons of payable reef in all the blocks, which can be developed; with working costs at only 18s. per ton, your venture should be most successful.

Mine Equipment.—Mill: A 10-stamp 1,650 lb. mill is erected on a concrete pile block, with mill bins, tables, etc., complete. This mill is capable of crushing 2,500 tons of ore per month, and with tube mills 6,000 tons. Crushers: Two crushers are installed capable of dealing with the maximum of ore required for the mill. Power: A 250-h.p. stationary driving engine for running battery, crushers, shops, pumps, etc., and also being large enough to run the tube mills which are on the property ready for erection. Cyanide works: Eight sands treatment tanks, 32 ft. x 6 ft., two slimes settling and two slimes treatment tanks, 50 ft. x 11 ft., are erected and capable of handling the maximum tonnage from the full plant; also five solution tanks, 30 ft. x 8 ft., are erected and in use, together with extractor boxes, zinc lathe filter press and all necessaries for running at full capacity. The boiler plant is erected in a central position, so as to feed all units, yielding 350 h.p., a Green's economiser being in use. A fully-equipped assay office is on the property, and a smelting furnace capable of doing any work required. The following buildings are erected: over boilers, fitting shops, mill engine, cyanide works, hauling engine, and other brick buildings, including a large office and store, cement and lime store, five married quarters, and a block of ten single rooms. The Tati and Inchwe rivers are within 3,000 ft. east and west of the mill, from which we pump our supply. Four tanks are erected for water storage, one 32 ft. x 11 ft., two 35 ft. x 10 ft. 5 in., one 8 ft. x 10 ft. Native labour is also very plentiful. When I say the mine is equipped with £30,000 worth of machinery, I think I am under-estimating a little, and when in full running order we shall be able to treat the ore as cheaply as any mine on the Rand.

Particulars of the further development of this property will be awaited with very considerable interest both here and in London and Rhodesia.

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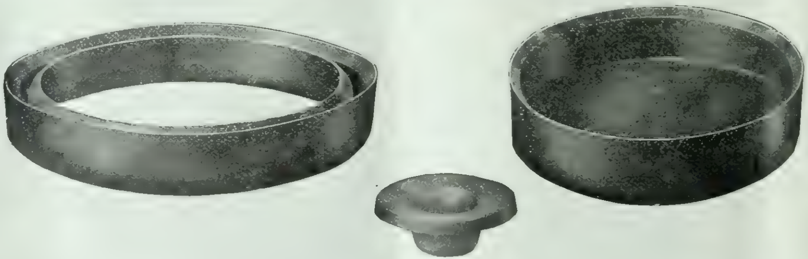

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THE WEEK IN THE SHAREMARKET.

Gold Stocks Irregular—Diamond Boomlet—Tins Active.

The course of prices this week seems to point to a diamond and base metal boom before the end of the year rather than any great activity in gold shares. It is true that next month gold dividends should be on a liberal scale, and the whole tendency in this section of the market is towards improvement. Still diamonds are the feature of the moment, and almost all the syndicates had an active week. Elands, Therons and Frank Smiths were the features, and all were most active counters at greatly improved prices. The patient holders who have been waiting for a rise for a long time were amply rewarded by the events of the week. Tins were likewise better, notably Zaaiplaats, and there are rumours of new and attractive flotations in this department. Coal shares remain firm, and industrials are steady, with the exception of S.A. Alkalis which had a more chequered career. The changes for the week were as follows:

	Fri., 14th.	Sat., 15th.	Mon., 17th.	Tues., 18th.	Wed., 19th.	Thurs., 20th.
African Farms	16 0	16 6	16 6	16 9	17 0	16 9*
Anglo-Americans	63 9	62 0	62 0	61 1		57 0
Apex Mines	7 9*	—	—	8 0	7 9*	8 0†
Bantjes Cons.	3 3	3 0*	3 0*	3 4†	3 1*	3 0*
Blaauwbosch	—	90 0†	90 0†		—	90 0†
Brakpan Mines...	68 0*	68 0*	68 0*	65 0*	65 6*	70 0†
Breyten Colls.	—	9 0	9 6	9 3	9 0*	9 0*
Brick and Potteries	—	4 6*	4 6*	4 6*	—	4 6*
British South Africa... ...	—	24 0*	24 0*	22 6*	23 6*	23 6*
Bushveld Tins	2 8	2 7	2 7	2 8	2 8	2 6*
Cinderella Cons.	5 9*	5 6*	5 6*	5 6	6 0*	5 9*
City & Suburbans	8 9†	8 9†	8 9†	8 3*	8 0*	8 9†
City Deeps	61 0*	60 0*	60 6*	59 6*	59 0A	57 6*
Clydesdale Colls.	29 6	29 0*	29 0*	29 0	29 0	29 3*
Cons. Investment	32 0*	—	—	31 0*	—	—
Cons. Langlaagtes	23 6†	23 6†	23 6†		—	—
Cons. Main Reefs...	11 6	12 0	12 0	11 6	11 9	11 6*
Cons. Mines Selection ...	31 0	30 0*	30 0*		31 0	30 6*
Coronation Freeholds... ...	2 6	2 7	2 7	2 8	2 9	2 9
Coronation Syndicates ...	—	—	—	12 0†	12 0	—
Crown Diamonds	11 6	11 7½	11 7½	11 10½	11 9	11 0
Crown Mines	65 0*	65 0*	65 0*	62 6	62 6*	63 0*
Daggafonteins	22 9*	—	—	23 0†	21 6*	22 6
Do. Options (4 years) ...	4 6†	4 3†	3 3†	4 3†	3 9*	4 0†
East Rand Coals	2 10*	2 9	2 9	2 9	2 9*	3 0
East Rand Deeps	1 0*	1 3	1 3	1 0*	1 1*	1 1*
East Rand Props.	9 9*	9 6	9 6	9 0	9 6A	9 6
Do. Debentures	£68½*	£67½*	£67½*	—	£67½*	£68*
Eastern Golds...	2 0†	2 0†	2 0†		—	2 0†
Ferreira Deeps	10 6†	10 6†	10 6†	—	—	9 6†
Frank Smith Diamonds ...	7 2	7 2	7 2	7 4	7 3	7 9
Geduld Props.	59 6	59 6	59 6	58 6	58 0*	56 6
Ginsbergs	2 9†	2 9†	2 9†	—		—
Glencairns	1 0	1 0*	1 0*	1 0*	1 0*	1 0*
Glencoe Colls.		—			5 6*	5 6*
Glynn's Lydenburgs	16 0			15 0*	16 6†	16 0*
Government Areas	97 3*	96 9*	96 9*	97 3	97 3*	97 9
Hume Pipes	25 0	24 6*	24 6*	25 0†	23 0*	22 0
Jhb. Bd. of Executors......	—	30 0*	30 0*		36 0*	36 0*
Jupiters	4 9*	5 0	5 0	4 6	4 6	4 6*
Klerksdorp Props....	2 0*	2 1*	2 1*	2 1*	2 1*	2 1*
Knight Centrals	6 6*	6 6	6 6	6 7*	6 5*	6 5
Knights Deeps	6 0*	7 6†	7 6†		7 6†	6 0*
Lace Props.	21 6*	21 6	21 6		21 0*	21 0*
Leeuwpoort Tins	30 9	31 3	31 3	31 [illegible]	30 9	30 9
Lydenburg Farms	8 6*	8 7*	8 7*	8 6*		8 6*
Meyer & Charltons				92 6		90 0*
Middelvlei Estates	2 9†	—		2 5*	2 6	2 4*
Modder B.	177 6*	178 0*	178 [illegible]	177 6	178 6	179 0
Modder Deeps	51 9	52 0	52 0	51 0	51 6	51 9
Modder Easts	32 7½	31 9	31 9	32 0	31 6*	31 6
Do. Options (3 years)	13 [illegible]	13 0	13 [illegible]	[illegible]	13 1½	13 0
Do. Options (4 years)	16 0†	15 7½	15 7½	[illegible]	15 1*	15 0
Natal Navigation Colls. ...	28 0*			27 0*		—
National Banks	307 0†	307 0†	307 0†	307 0†	307 0†	—
New Boksburgs	1 10*			2 [illegible]	2 [illegible]	2 0*
New Eland Diamonds ...	74 9	78 6	[illegible]	95 0	[illegible]	85 0
New Era Cons.	12 0	12 3	12 3	[illegible]	12 3	12 6*
New Geduld Deeps	2 1†	2 9†	2 9†	[illegible]	1 11*	1 11
New Heriots	[illegible] 6	10 0†	10 0†		10 0†	8 0*
New Kleinfonteins	11 6A	12 3	12 3	12 3	12 [illegible]	11 6*
New Modders	£30½*	£30½A	£30½A	[illegible]	£30½	
New Primrose		6 0†	6 0†			
New State Areas	32 6A	32 9	32 9		32 3	31 9*
New Unifieds	5 0*	5 0*	5 [illegible]		5 0*	5 0*
Nigels	7 0*	7 0*	7 [illegible]	7 0*	7 6*	7 6*
Nourse Mines	16 0†	16 0†	16 0†	15 0†	12 6*	12 6*
Pretoria Cements	96 0*	97 0	97 0	97 6	98 0	96 0*
Princess Estates	2 9*	—	—	3 0†	2 9*	2 10†
Rand Collieries	3 7*	3 6*	3 6*	—	3 6*	3 6*
Rand Nucleus	2 0*	2 0*	2 0*	2 3†	2 1	2 1*
Rand Selections	92 6	93 6	93 6	99 0	99 6	99 6*
Randfontein Deeps	6 0A	6 6*	6 6*	6 3*	6 3*	6 3*
Randfontein Estates	25 6	25 6	25 6	24 3	24 3*	24 0
Roberts Victors	16 0	17 0†	17 0†	15 6*	16 0	—
Rooibergs	7 0*	7 6	7 6	8 6	8 0	8 6
Roodepoort Uniteds	—	—	—	3 9*	—	—
Ryan Nigels	5 6†	5 6†	5 6†	—	—	—
Shebas	2 0*	—	—	—	2 0*	2 0
Simmer & Jacks	6 6*	6 6*	6 6*	—	6 0*	—
Simmer Deeps	—	2 3*	2 3*	2 0*	2 0*	2 0*
S.A. Alkalis	50 0	53 6	53 6	57 6	55 0	54 0
S.A. Breweries...	40 0*	40 0*	40 0*	40 0*	40 0*	40 0*
S.A. Lands	6 7*	6 8*	6 8*	6 9	6 8	6 8
Springs Mines	56 0	55 0	55 0	54 6*	54 9	54 6
Southern Van Ryns... ...	8 6*	8 6*	8 6*	8 7	8 3	8 3
Sub Nigels	20 9	20 10½	20 10½	20 9	20 9	20 9
Swaziland Tins	—	18 0†	18 0†	18 0†	18 0†	18 0†
Transvaal Lands	—	27 6†	27 6†	—	—	27 6†
Transvaal G.M. Estates ...	15 6*	15 9*	15 9*	15 9	15 9†	—
Tweefonteins	25 0	26 0*	26 0*	26 0*	26 0*	26 0*
Van Ryn Deeps	91 0	92 3	92 3	90 0*	89 6	88 6*
Van Dyks	2 9*	3 0	3 0	3 0	3 3*	3 4*
Village Deeps	14 0	14 9	14 9	14 6*	15 0†	—
Village Main Reefs	—	8 0†	8 0†	7 6*	8 0†	8 6†
Welgedachts	32 0†	31 3†	31 3†	—	32 6†	31 3†
West Springs	27 6	27 3	27 3	26 9*	26 6	26 0
Do. Options	10 6*	—	10 0*	10 0*	10 0*	10 3*
Western Rand Estates ...	11 3	11 3	11 3	12 6	11 3	11 6
Witbank Collieries	70 0*	70 0*	70 0*		70 0*	70 0*
Wit. Deeps	9 9†	9 0*	9 0*	9 6*	9 6*	9 6
Wolhuters	3 3*	3 3	3 3	3 3*	3 3*	3 3*
Zaaiplaats Tins	8 0	9 6	9 6	9 7	9 6	11 5
Union 5 per cent.	£103*	£103⅛	£103⅛	£103⅛	£103*	—
New Stock, 4½ per cent. ...	£102*	£102*	£102*	£102*	£102*	£102*

*Buyers. †Sellers. AOdd lots. BEx London.

PERSONAL.

Mr. T. H. Bayldon has resigned the management of the Bush Tick Mine, Matabeleland.

* * * *

The list of certificates issued by the Mines Department for the period ending 19th November, 1919, is as follows: Mine Overseers (Metalliferous Mines): H. V. Batten, F. A. Botha, M. Brownie, R. C. H. Cooke, B. D. Kinahan, M. Morisse, S. B. Schwabe, H. C. V. Seymour. Mechanical Engineers: W. E. K. Brindley, E. A. Holton, C. W. Turner.

That output in some trades can be largely increased is shown by recent events at Brown Bayley's Steel Works, Sheffield, where the workers in the melting department have formed themselves into a society and have actually doubled the normal output of the furnaces. Having reached the limit of the furnace output, they are turning their attention to improving the quality of the products and to the elimination of waste.

The list of certificates issued by the Mines Department for the fortnight for the period ended 31st October, 1919, is as follows:—Mine Overseers (Metalliferous Mines): T. Alexander, W. J. Carbis, W. E. Floyd, H. H. Hastings, J. D. Mackenzie, N. J. Meiring, P. Rodgers, C. H. Rowe, W. Scott. Mine Surveyors: E. H. Kemp, J. P. Roux. Mechanical Engineers: W. Kydd, F. T. Stokes; with endorsement of "Mining Machinery": S. Hogg, C. L. Liesching, W. S. Mackintosh, J. T. Spiers, J. Thomas, H. Watson, T. H. Wells. Electrical Engineers: L. B. Sparks; with endorsement of "Mining Machinery": J. H. Bower, W. Burns, A. de V. Gibson, J. C. Gough, J. E. G. A. Langeveld, J. Lyall, M. Simons, T. Tucker, J. H. Veasey.

AFRICAN OIL CORPORATION.

Visitors Impressed—The Question of Values.

We understand that one or two disinterested gentlemen who have visited this company's properties in the Wakkerstroom area have now returned to Johannesburg and have expressed themselves as being agreeably impressed with what they have seen there. Good solid exploratory work is in progress and the general outlook for the company is considered to be satisfactory. It is perhaps not generally appreciated that Mr. Mills Davies, the company's consulting engineer, has based his estimates of recovery value on most conservative figures. Mr. Mills Davies, in his report, stated: With regard to the value of the crude oil itself we may take the following figures as representing the percentages of the various products that would be obtained from the refining of, say, 25 gallons of it. They are based upon analyses of the crude oil retorted from the "main" shale seam. The prices attached are those which prevailed in Johannesburg before and at the beginning of 1914, and are, therefore, lower than they are likely to be for a long while if at all.

Products on Refining.

	Per cent.	Gallons per ton.	Selling price.	Total value.
Motor spirit	5	1.25	3/4	4/2
Burning oil	30	7.50	1/6	11/3
Lubricating oil	40	10·00	2/0	20/0
Solid paraffin	10	2.50	3/0	7/6
Ammonium sulphate ...	—	50 lbs.	0/1½	6/3
				49/2

Equal to a value of, say, 50s., or approximately 2s. per gallon of crude oil retorted." The selling prices given above are, of course, very materially under the prices obtaining to-day. Ammonium Sulphate is taken by Mr. Davies at 1½d. per lb. We understand that the Natal Ammonium Company is obtaining 6d. per lb. for its product. The value of ammonium sulphate on a basis of recovery of 50 lbs. per ton is therefore 25s. instead of 6s. 3d. as conservatively given by Mr. Mills Davies. Other products are commanding proportionately higher prices and are likely to continue to do so for some considerable time to come. The total recovery value is in fact very much nearer £5 than 50s. as reckoned by Mr. Mills Davies. At the same time it is well to be on the safe side, and if we accept 50s. only there should be substantial profits in the venture. This is the equivalent of a twelve pennyweight proposition in gold mining parlance, and as the conditions for cheap working are favourable the African Oil Corporation has an undertaking which potentially at any rate is a handsome profit earner.

The Lonely.

The following are particulars of output of gold, etc., from the Lonely Mine for the month of October, 1919: Mill ran 703 hours; crushed 4,600 tons; fine gold recovered, 2,234·881 ozs., value £9,404 10s. 11d.; slimes treated, 4,600 tons; fine gold recovered, 3,974·568 ozs., value £16,726 14s. 6d.; total fine gold, 6,209·449 ozs.; total value, £26,131 5s. 5d.; profit, £13,817 14s. 4d.

South Wales Profit-Sharing Scheme.

The first definite profit-sharing scheme in South Wales has been formulated by the Blaenavon Company, Ltd., of Monmouthshire, which employs several thousand workmen in the coal, iron and steel industry. The company proposes to establish a scheme under which every employee can participate in the profits on the basis of a guaranteed 7½ per cent. per annum on all amounts invested up to a total of £500 with the further provision that in case the dividend on ordinary shares exceeds that rate per cent. the workmen investors will participate in the additional profit. The Blaenavon Company is one of the oldest and most extensive undertakings of its character in South Wales. It comprises four collieries and blast furnaces, seven Siemens steel furnaces and steel mills, besides extensive by-product plant. The project has been laid before workmen representatives, and at the outset has met with a degree of approval which augurs well for its ultimate acceptance.

Hemp Decorticating Plant.

Under the title "Hemp Decorticating Plant" Messrs. Robey & Co., Ltd., of Lincoln, England, have issued a booklet which is at the same time an informing review of the history of the sisal industry as well as of the latest machinery for decorticating and dressing the various plants which furnish the fibre. The world's production of hard fibres in 1915 is stated as follows: Philippines (Abaca, or Musa textiles), 140,000; Java (Abaca, or Musa textiles), 600; Mexico (Henequen or Agave Fourcroydes), 135,000; Cuba (Henequen or Agave Fourcroydes), 3,000; Java (Sisal or Agave sisalana), 6,500; Bahamas (Sisal or Agave sisalana), 4,300; British East Africa (Sisal or Agave sisalana), 3,750; Hawaii (Sisal or Agave sisalana), 1,000; Portuguese East Africa (Sisal or Agave sisalana), 600; German East Africa (Sisal or Agave sisalana), none; New Zealand (Phormium tenax), 23,225; total, 317,975. The prospect for Agave sisalana in East Africa "is alluring."

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ENGINEERING SECTION.

THE VICTORIA FALLS AS A SOURCE OF POWER.

Mr. W. Carter, in the Rhodesian Munitions and Resources Committee Report, writes of the Victoria Falls that statements had been made that the river at this point was 800 to 1,000 yards wide, 80 to 90 feet deep, and had an average velocity of about four miles an hour. It was from unreliable data of this nature that the immensity of the power to be derived from the Falls was in part deduced, and calculations based on these figures would give about one hundred times more power available than can be arrived at from actual measurements during the period mentioned above. The volume of water which might be utilised during the flood season is not taken into consideration except in connection with the position of a power station.

Width of the River.

Several ineffectual attempts were made to get a line across the river at the point mentioned, but the materials available were unsuitable, and the width of the river was eventually arrived at by triangulation, which gave a result of 373 yards. Three sets of soundings consisting of forty soundings each were taken across the river at one hundred yards intervals up and down the stream; the greatest depth obtained being 26 ft. 3 in., and the mean of the lot being 18 ft. Sighting marks were then laid out on the bank 200 yards apart and numerous floats with their current boards suspended at varying depths were checked over their distance at various points in the width of the river; this gave a mean velocity of seven hundred yards an hour, or a volume of seven hundred and four thousand nine hundred and seventy cubic feet per minute. As there are no affluents to the river below this point, the Maramba being merely a backwater, this can be taken as the volume which actually passed over the lip of the Falls. The width of the Falls across the crest is about one mile eight chains, and is divided as follows: North-Eastern Fall, Rainbow Fall, Main Fall and Devil's Cataract, the greatest fall in the clear being 360 feet; measurement taken with weighted line. The Maramba river, previously referred to, but which is actually a backwater, is a likely place to tap the river, and if the water is conveyed from this point to a power station in the gorge by means of steel pipe lines an additional 20 feet of head could be secured.

Available Head.

Taking three hundred and sixty feet as the head due to the actual fall, and adding the twenty feet for the drop from the intake to the crest of the Falls, the total head available is three hundred and seventy feet, assuming the turbines are kept ten feet above the water in the canon, and disregarding pipe line friction, but the question of high water in the river has to be considered. At the point where the soundings were taken the rise during flood times was nine feet, and this corresponds to a rise of forty-four feet in the canon, giving a ratio of about five, which though not true at all heights, is sufficiently accurate. It is more than probable that, in an excessively rainy season, the river would rise eleven feet, giving a rise of fifty-five feet in the canon. Taking the position of the turbine station as above this flood mark, it would reduce the available head to three hundred and fifteen feet. Assuming an efficiency of 85 per cent., and a further loss for pipe line friction the power available is equivalent to about 263,000 kilowatts if the total volume of water as above estimated could be utilised. Although the amount of power available from the Victoria Falls, during the period of the year when the river is low, is nothing like so great as has been widely imagined, the dormant power is enormous and no doubt a large part of it will be utilised at some future date.

The Commercial Standpoint.

From a commercial point of view there is no early prospect of generating power on a large scale. To attempt to supply power requirements throughout Rhodesia would involve many leads over long distances fnr a comparatively limited demand. Transmission to the Rand is, with present knowledge, out of the question, there being no prospect of successful competition with the cost at which power can be generated in proximity to the collieries there, and electrification of the railways of Rhodesia is so far outside the range of probability that the question is not worth discussion at present. With modern progress and the great advance in electro chemical industries during recent years it can easily be conceived, however, that a large industrial centre may gradually develop in the future.

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CORRESPONDENCE AND DISCUSSION.

Oil Discoveries: Why Not a Government Bonus?

To the Editor, *S.A. Mining and Engineering Journal.*

Sir,—There have been many endeavours to find oil in payable quantities in South Africa, but so far without success. While not being one of those who desire the Government to spoon feed every industry, still, in view of the fact that the founding of an oil industry would be of such an immense value to the country, I do think this is a matter in which the Government should do something to encourage it and give it a real start. I am moved to write this note by the fact that the Australian Federal Government has just decided to offer a bonus for the discovery of oil in commercial quantities in Australia. This will do something towards encouraging those enterprising people who are searching diligently for fuel oil. It is certainly a step which our Government should consider the advisability of following, although possibly a better move would be to make a grant, say on the £ for £ basis until a find was made, because searching for oil is certainly a most expensive business. Should a remunerative find be made, possibly some of the funds advanced might be repaid. But it appears to me that if such a valuable industry as a fuel oil industry is to be founded, some stimulus should be given, and as it is all to the benefit of the country and its whole population, the Government should lend a hand.—Yours, etc.,

OIL FUEL.

18th November, 1919.

[Need we say that we heartily support our valued correspondent in this matter, and may remind him that we advocated the same measure some months ago.?—Ed.]

ANSWERS TO CORRESPONDENTS.

All enquiries addressed to the Editor must bear the writer's name and full address. We cannot reply to enquiries by letter, but telegrams with replies prepaid will be answered. Correspondents are requested to write their names and pseudonyms distinctly.

"W.F.H." (Rondebosch).—(1) 7s. 6d. to 8s. (2) 4s. 6d. to 5s. Both are suffering from the prevailing depression in Rhodesian shares and may improve in a better market.

"Finance" (Bloemfontein).—A fair mining risk.

"F.R."—Thanks.

"Eager" (Malmesbury, C.P.).—Both are gilt-edged gold mining investments and should appreciate with any advance in the market. Better dividends will be paid, and the splitting schemes should further improve the price. We should certainly not sell now.

"Shareholder" (Kimberley).—Not before the end of the year.

As War is an instrument of diplomacy, so, to the trade unionist, the strike is the weapon of negotiation, says Mr. J. T. Brownlie, chairman of the Executive of the A.S.E., in *Unity*. There are always three parties involved in industrial upheavals, viz., the workers, the employers, and the community. I am convinced, he says, that the community will in future, as in the past, make provisions for its own protection, for it cannot allow its general convenience and its welfare to be imperilled by any section, however impetuous it may be. Trade unionism is at the present time more powerful than it has ever been at any previous stage in its history, and for that very reason its responsibilities are vast. If the trade unionist does not realise his responsibilities and pursues a policy detrimental to the general interest of the community, the community must take steps to safeguard itself. There is a section of the community which believes that all industrial disputes must be settled by compulsory arbitration. Personally, I am opposed to compulsory arbitration, for I believe that if it were possible for the unions to enter into agreement with the employers for the settlement of industrial questions the use of compulsory arbitration might well be dispensed with.

Enemy Trade Restrictions.

In the current *Government Gazette* it was notified for general information that it is now lawful for all persons in the Union to trade and have commercial and financial transactions with persons resident or carrying on business in Germany, Austria, those parts of Hungary which are in Allied occupation or are included in newly-constituted States, Turkey and Bulgaria, subject to the restrictions and conditions that this permission shall not be extended to, or be deemed to cover, any transaction involving: (1) The payment of money arising out of pre-war transactions. (2) The delivery of or dealing with property held in the Union for persons in any of the above territories since before the outbreak of War. (3) The transfer of securities by or on behalf of a person in any of the said territories. (4) The allotment or transfer of securities issued by a company to or for the benefit of a German, Austrian, Hungarian, Turkish or Bulgarian subject. (5) The transfer of any debt or other obligation due to a person in any of the said territories. The necessary permit for this trading can be obtained from the Controller of Imports and Exports, Department of Customs, Pretoria. Any moneys paid or transmitted by the late enemy subjects, must pass through the Custodian of Enemy Property, Pretoria, as also all correspondence relating to debts, or claims arising out of transactions entered into or commenced previous to the outbreak of War. It is further notified that, save for the ordinary control of imports and exports generally applicable, there are no such restrictions on trade with Norway, Sweden, Denmark, Holland, Switzerland, Poland, Finland, Esthonia, Lettland and Lithuania, and that Consular certificates of origin and interest are no longer required in respect of goods imported into the Union of South Africa.

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TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Better Feeling in Town—The Building Boom—A "Cause Celebre" Anticipated—Iron and Steel and Machinery—American Impressions—Second-hand Timber and Iron—Profiteering and "the Policeman."

THERE is a better feeling in town and business is slightly better. It seems that the chief reason for this is the extra demand in connection with so many people going to the diamond diggings and various parts. Naturally all these must have some kind of digging implements, and a certain amount of machinery in connection with their new enterprise. In addition to a number of small syndicates, there are some decent new companies afloat. It is said that a resuscitated farm adjoining the great Premier Mine will be brought into some prominence early in December. In addition to the diamond diggings there is a better demand concentrated on Johannesburg for material right away from Kimberley to the Belgian Congo. The optimistic speeches made by the Premier and others also have a lot to do with this improved feeling. The agricultural implement dealers have been quite busy since the drought has broken. Many of their orders for ploughs, cultivators, harrows, etc., have had to be held over, but now that a ship has arrived from Canada with all kinds of agricultural implements, much of which is on the way from the coast, this will soon relieve the rather acute position of shortages. The engineering shops in town and on the Reef have more orders and rather a strong demand has sprung up lately for cast-iron machinery scrap for these foundries, of which there is a scarcity, as the excellent price of £7 10s. has been paid therefor. For wrought iron, scrap and steel, the price is about 45s. a ton by our Transvaal ironworks. The special dealers in Dunswart iron and Vereeniging steel have been quite on the busy side during the past fortnight with orders from places in all parts of the Union.

THE BUILDING BOOM.

Everything is going merrily on and all Baltic timber is on the scarce side; it is difficult to quite gauge the position. A statement was made that long lengths of deals were practically unobtainable. This information was followed up, and according to the latest prices on the Commercial Exchange a quotation of 1s. 11d. was made for a small parcel of 20 ft. lengths. That is also the nominal quotation for 18 ft. and 19 ft. For ordinary timber the quotations are: Deals, 1s. 8d. to 1s. 9d.; floorings, 9d. to 9½d.; ceilings, 6¼d. to 6½d.; galvanised roofing iron, 24 gauge, is 1s. 5½d. to 1s. 7d. per ft., according to length, and stocks are very scarce, but there are fair quantities on rail from the coast. As regards timber the cables advise the last timber having left the Baltic for the winter season. It is difficult to anticipate the future because the European demand is so great. However. the prices may remain much the same until next spring, when renewed activity is expected. Very little loose timber or iron is available in Johannesburg, either new or second-hand, but this does not mean that all the yards are exactly bare, as much timber has been sold and kept until required on the various jobs. The contracting builders are disinclined to tender for any new jobs this side of Christmas, as expert labour is scarce and new orders for bricks will not be accepted for several months to come. It is surprising to see what a number of pioneer houses are disappearing, almost at every corner of the streets, through Marshalls township and the City and Suburban, almost down to Jeppestown. It is difficult to get carpenters, as a few wanted at Springs have been promised 1s. per hour, and even this was not sufficiently tempting to fill up the number wanted. We are pretty quiet as regards building employees' labour troubles, certainly on the surface, whatever may be brewing. It appears quite a *cause celebre* is in the wind against the Master Builders, who have black-listed somebody or other. Counsel have already been engaged; a full list of the masters concerned has been secured, apparently through leaving too many papers about in their Council Chamber. Another little bit of news on the tapis is that an association is being launched on behalf of the coloured building artisans, who purpose tendering for jobs placed in the open market. Whether such a contingency arises remains to be seen. That, however, is the gossip amongst the untrammelled building contractors. As regards building, nothing seems to stem the activity, as new warehouses and garages are going up in all parts of the town. Whatever all the garages are going to do remains hidden in the womb of the future. One heard of cases where blocks of six stands are being negotiated for in the business quarters

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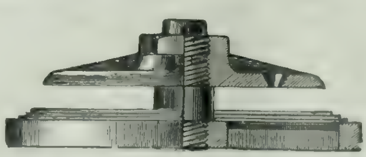

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of the east end. The latest one is where the building is required for an extra large dry goods stores and also a big tobacco warehouse. Several blocks of 100 x 100 (three stands) are being negotiated for for warehouses and various local manufacturing enterprises.

Farms and Other Property.

There is a good demand for all kinds of farms situated within easy distance of a railway station and particularly those having a decent supply of water. On each recurring sale of a leading auctioneer, the man in the rostrum usually remarks that sellers are getting too greedy, which prevents a lot of business being transacted. However, there is no pessimism as regards agricultural land, as whoever is spoken to is thoroughly imbued with the idea that this is the coming boom when the town properties have a bit of a rest. The latter contingency is not anticipated for the next year or so, as those wishing to come to South Africa who are now on the £10 deposit waiting list are not expected to be cleared before the early spring of next year, which is something to the good after all our pessimistic talk. The housing problem is a very difficult one, and as Johannesburg is the Eldorado of most of the new people coming to this country it would seem that the builders and their artisans will be fully employed for many a long day to come.

Oils and Colours.

The demand for ready-made paints is ever on the increase, particularly now that the first rains have washed the outside of the roofs, showing many of the defects after five years' paintless existence. White lead is 90s. per 100 lbs., and 1s. to 1s. 3d. for smaller lots; linseed oil, 100s. a case for raw, and 115s. for boiled; turps, 110s. to 115s. for 2-4's, and 125s. for 10-1's; castor oil, No. 1 115s., and No. 3 100s. The best American salad oil is 145s.; South American, 125s.; South African, 95s. to 97s. 6d. per case of 2-4's; olive oil, 35s. per gall.; engine and cylinder, 40s. to 45s.; grease, imported, £42 10s.; best local, £32 10s., and seconds, £30 per ton. The local grease is expected to become dearer as the demand for the local and coast soapmakers is always on the increase for the raw material of fats and offal. Plate and window glass is scarce, and according to the latest advices from St. Helens, the chief manufacturing centre, it is anything but encouraging as the demand from the Continent is so great and the manufacturing position is full of troubles. Here again the floating or spare quantities of plate glass are, to say the least, very disappointing. The mirror trade in Johannesburg is not quite so good as it was, because the coast makers are cutting into the preserves of the Johannesburg manufacturers.

Iron and Steel and Machinery.

Some sizes of steel plates are getting scarce, but as a general statement there are sufficient to go on with. The price is 40s. per 100 lbs. for ½ in., ⅝ in. and ⅜ in.; and ¼ in. plates 45s. Dunswart iron is 30s., and Vereeniging mild steel 33s. 6d. to 35s.; second-hand light rails, 12, 14 and 16 lbs., are scarce, but the price is £22½ per ton, but all orders cannot be fulfilled. Barbed wire, 720 yards, 48s. per roll; and No. 8 fencing wire, 40s. per 500. Business for barbed and fencing wire has been exceptionally slow since the first rains, presumably on account of the farmers being busy with the cultivation of the land. A mining material merchant states that the general orders are more plentiful and prices are hardening throughout the list. There is an excellent demand for baling wire at 30s. for No. 14 and 31s. for No. 16; imported mild steel, 35s. 6d. per 100 lbs.; brass rods and plates, 2s. 6d. per lb.; drill steel, 7½d.; and tool steel 1s. 3d. per lb. One merchant remarked that prices have a tendency to harden, although he would be only too pleased to get cost price for a large consignment recently received from Great Britain. The price of shovels is 65s. a dozen. Wire nails are getting dearer, and there is a scarcity of some of the smaller sizes; price is 50s. for small sizes, and for larger anything from 35s. to 42s. 6d. per 100 lbs. Wheelbarrows are 50s. each in Johannesburg, and about 42s. 6d. ex coast. Imported buckets, say at 9s. 6d. each, are being replaced by the Johannesburg-made article at 5s. 6d. each, weighing about 2½ lbs. against the imported at about 7 lbs.

American Impressions.

One of our leading American importers, who has just returned from a trip to the United States extending over some months, was good enough to give us a few of the impressions of his visit, which, coming from a man "raised" there and only just back in Johannesburg, will possibly be read with interest. He says things are undoubtedly serious there at present, with prices of everything very firm and likely to go higher, especially in steel goods. The coal miners' strike will indubitably create a shortage in certain materials, to say nothing about the steel strike, which has been on since the 22nd September last. Not all the men are on strike, but if only 25 per cent. are out the trouble assumes serious proportions. The whole of America is at the present time in a very prosperous condition, and there is a tremendous demand for most products. Buyers from other countries, like South America, China and Dutch East Indies are not quibbling about present prices and are even offering bonuses to get orders accepted, while buyers from this country are not offering bonuses and consequently will have to wait a long while before being supplied. In the western part of America things are all right, but east of the Mississippi there are lots of labour troubles, turmoils, strife and dissatisfaction on account of the high cost of living. People in this country (and in most others) ought to go down on their knees, he said, and thank God for the comparatively satisfactory position in which they find themselves. American people to-day are paying higher prices for everything than any other country in the world because other people are offering premiums for goods. Our informant, who had not visited America since 1915 until this year, had never seen such a change in any country in his life. From San Francisco to New York the same conditions prevailed. It was generally thought the next six months would tell whether the workmen would settle down again quietly to

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work or whether general havoc would be wrought throughout the whole world. South Africa, for all its products, was pretty much dependent upon Great Britain and America, and would prosper or suffer according as things went during the next half-year.

SECOND-HAND TIMBER AND IRON.

While second-hand materials are not too plentiful, we succeeded in striking one yard which had been successful in getting a fairly large consignment of both second-hand timber and iron within the last few days. Unfortunately, however, the present stocks will only suffice to partly fill the orders on hand, leaving several large orders on hand uncompleted, not to speak of future ones which are coming in very freely. In other words the demand still continues much greater than the supply. Many firms are now supplying materials on orders which were received some two months ago, as, for example, one second-hand dealer had 800 tons of iron arrive at Delagoa Bay for him this week which had been booked two months ago. In one yard a buyer wanted £500 worth of material, and no particular hurry for delivery, but the dealer, in view of present circumstances, was afraid to book the order and maybe court a possibly big loss. Second-hand timber is ruling at 1s. 6d., and for new 1s. 8d. is paid; for iron, new, the price is also 1s. 6d., but prices still have a hardening tendency.

BRITISH MANUFACTURERS.

A circular letter has been issued by the British trade representative calling a meeting for December 4th of merchants and others with the view of starting a branch of the British Manufacturers' Association for Johannesburg. Naturally the notion is to assist with ideas and specimens, the British manufacturers to cater for the South African market. This is excellent, but the conveners must not be content with a tame stereotyped circular, but a hustle round with a little money behind it is absolutely necessary to make the thing go. A traveller or two to enthuse the busy man who has his own business to attend to at this opportune moment should make the meeting go off with eclat instead of maybe like a damp squib.

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PROFITEERING AND "THE POLICEMAN."

The local committees under the control of the Customs Department in connection with the cost of living will soon be in evidence both in Johannesburg and on the Reef. The names have already been sent to Pretoria for confirmation. The chief good of these committees will be to act as policemen—policemen in a smart Government uniform just to keep their "weather eye" open on the speculators and hoarders of foodstuffs and maybe men's and women's clothing, boots, medicines and every trade item. In an oversea exchange a chemist said that the British Act was only tinkering with the question. The world shortage of goods gave the profiteer a favourable field, and the real cure was to be found in natural economy and in increased production. Just two or three actual cases are illuminating. A woman stated that she bought medicine from a chemist and was charged 3d. for the bottle. When she returned the bottle she was only offered ½d. A grocer charged 5d. per ounce for pepper, purchased at 2s. 1d. per lb. He was ordered to refund half the price charged and the chairman described the case as one of flagrant profiteering, of which it was possible more would be heard later. In another case the allegation was that a trader charged an unfair profit for a four-oz. jar of marmite. The complainant said that she had previously paid 1s. 3½d. and now 1s. 6d. Evidence for the defence showed that the makers had raised the price 2s. 6d. per dozen, therefore the case was dismissed. One almost was looking for profiteering on reels of cotton, but alas these are said to be chiefly a matter for the great trusts, as the profit is well snipped before leaving the factory. What about our soaps and candles and other things, under the great trusts at the coast? However, these small matters as given to show that our committees are likely to follow the proverbial "anchor to a needle" policy in their investigations. Those who have been under auditors will recall that it was a case of not altogether being sorry when they dropped in and called for the keys—but it was a great relief when they had gone. These auditors are the policemen of the commercial world, and it may be that our private limited companies who ignore them will be brought up with a round turn one of these days.

Apex Mines.

At the Apex Mines Colliery 14,432 tons of coal were won in October. The profit for the month was £626.

Natal-Zululand Railway.

Accounts for the year ended 31st August show a total income of £13,982 (against £14,108), there being a profit, after meeting interest charges, etc., of £2,586, and including £2,315 brought forward, an available sum of £4,902. A further dividend of 1½ per cent. has been declared, making 2½ per cent. for the year, the same as for the previous twelve months, leaving £2,197 to be carried forward.

Mashonaland Railway.

The accounts of the Mashonaland Railway show that, after providing £302,776 for debenture and other interest, £30,000 for depreciation and renewals of permanent way and work, and £17,806 for depreciation and renewals of engines and rolling stock, the net revenue account for the year ended 30th September, 1918, shows a loss of £40,312, which, added to the debit balance of £1,495,925 brought forward and £8,605 reserved for arrears of maintenance of permanent way, etc., makes a total debit balance of £1,544,842.

COLLIERY NOTES AND NEWS.

Activity in the Ermelo Coalfields.

Ermelo, in view of its situation in relation to the Durban-Delagoa Bay Railway and the Breyten-Johannesburg line, is most favourably placed for the development of a coal trade and as the measures there are extensive and of good calorific value it is considered probable that there will be very considerable extension of activity in that area in the near future. The Breyten Collieries, which are understood to be now owned by an important shipping firm, and the Carlchew Collieries are situated in this district, and there are other important coal propositions there which will be dealt with in our forthcoming coal supplement. Boring has recently been proceeding on the farm Sterkfontein, which is owned by the Transvaal Anthracite Colliery. Sterkfontein is 4,500 acres in extent and it is considered that probably from 75 to 80 per cent. of the area is coal bearing. The boreholes have disclosed coal of excellent calorific value, which has gone as high as 13·45, and the general analysis of the coal is very satisfactory. It is estimated that there are over twenty million tons of coal on this property which can be worked at a low rate of costs. The farm Sterkfontein is distant 2½ miles from the Breyten railway junction.

Notable Achievement in War Engineering.

The well-known engineering firm of Sir W. G. Armstrong, Whitworth & Co., have issued in the form of an illustrated booklet a brief record of the war work completed up to the time of the armistice. More than 13,000 guns and carriages were completed, the sizes ranging from 6-pounder tank guns to 18-inch naval giants, weighing 152 tons each. The total number of war vessels built was forty-seven. In addition, sixty-two warships, including nine Dreadnoughts, were fitted with armament. All our submarines carried Elswick torpedo tubes, and 970 of these were supplied. The output of ammunition was increased at an incredible rate, and the changing conditions of military operations often involved urgent modifications in the type of shells supplied. For example, the delivery of 18-pounder H.E. shells at the end of 1914 was 7,000 per week. By 1916 this had increased to 50,000. The total number of shells turned out was 14,500,000. In addition, fuses were made to the number of 18,500,000, and 21,000,000 cartridge cases, 4,400,000 lyddite block charges, and 3,000,000 filled shells are other totals reached. Aeroplanes and tanks were also made in considerable numbers, and the valuable pioneer work in airship construction has resulted in the successful building of the familiar R 33. Reconstruction is now occupying the attention of the firm, and we may confidently expect, with such an admirable record of British enterprise, that the future will bring many interesting developments in the application of engineering to the requirements of civil life.

A New Cement Works at Beira.

The formation of a company to manufacture a high-class cement almost at the very threshold of Beira raises visions (says the *Beira News*) of possible development which would eventually revolutionise the appearance of the town and, what is even of more moment, provide the material at first hand with which the port may be advanced, within a very few years, to a hitherto undreamt-of completeness, with accommodation for the whole of its shipping at deep-water wharves. At any rate, these are the prospects which naturally present themselves on the flotation of the Beira Portland Cement Company, with its normal capital of £100,000 and its working capital privately subscribed, for the transformation of the almost illimitable calcite and clay deposits alongside the railway line at Siluvu Hills, 73 miles from Beira, into the cement of commerce. None of the shares have been offered to the public, and as the company is regarded, owing to the extensive character of its resources, as a parent concern, no shares will ultimately be offered for public subscription until such time as the original company is producing cement on a considerable scale, when it may then be deemed expedient to enlarge the operations to a point beyond that presently in contemplation. It is expected that the plant already being laid down at the Siluvu Hills will be ready soon after the beginning of the year. The main plant, which is on order, will it is hoped reach Beira from England within a year from now. This plant will have a capacity of 7,000 tons weekly, and it is hoped, with a large demand from Beira for comparatively cheap cement for building and other purposes.

Sub Nigel.—With reference to the published results of operations for the month of October, the following further information is given: The declared profit for October was £5,924, after taking 800 ozs. from the gold reserve, the actual profit earned for the month being a little over £2,500 as compared with £6,000 for September. The ore crushed was 200 tons less than in September, but the screen value was 2·191 dwts. per ton higher. As is usually the case when the average grade of ore dealt with is raised, the plant retains a proportion of the increased gold put into it. The actual gold realised for October consequently showed a deficit of 400 ozs. as compared with the screen value. This deficit followed on a considerably larger surplus for September. The actual results for September were therefore considerably higher, and those for October lower, than the results called for by the screen assays of the ore. The cost of development charged to working costs for October was £6,850 for a footage of 1,692.

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HANGING WALL SUPPORT ON THE FAR EAST RAND.

[By L. W. Mayer.

THAT the problem of the support of hanging wall in the deeper mines of the Far East Rand has engaged the attention of the mining men concerned for some time past is perhaps generally known, and it appears to the writer that the advantage of making the subject one for discussion by this Society should be recognised. The objects of these notes are, firstly, to place the problem before those engineers who, not being conversant with East Rand mining, may have been faced on other fields with similar conditions, and, secondly, to bring forward suggestions for the utilization of waste material, such as old ropes and pipes, in the construction of roof supports. An opinion has been widely held that the panacea for hanging wall trouble in flat mines lay in the "adoption of colliery practice," but to the writer, and to others who have come to the East Rand with coal mining experience, it has become apparent that to deal with a colliery roof is an entirely different proposition from the support of an East Rand hanging wall. The difference is best explained diagramatically. In Fig. 1, A. represents a section of a longwall face, and B. a flat stope face where hanging wall trouble has become acutely interesting. The forces acting and the direction of those forces are precisely similar in both cases, yet the effects are very different. The hanging in A. has subsided in a gradual manner, its surface approximating a curve from the coal face to the goaf, whereas in B. cracks have developed at and parallel to the face, and the hanging throughout the stope has broken up and has none of its original stability. The result is the development of a danger zone between the last pack and the face, which means that work has to be carried on in a veritable death trap, whilst in coal mining perhaps the safest place in the mine is at a systematically propped longwall face. The reasons for the difference in the conditions of hanging wall are: (a) The difference in the relative rates at which the faces of coal and reef are worked. (b) The initial resistance of the supports used in the different classes of mining. The difference in the rate of advance of a stope face and a longwall face is, of course, considerable. A stope face equipped with machines breaking one fathom per machine shift will only advance about 12 ft. per month, the general average for a mine being much less than this, whilst a longwall coal face equipped with disc coal cutters and mechanical conveyors will advance the depth of their cut, namely, 4 ft. 6 in. to 5 ft. per 24 hours. To the relatively slow advance of a stope face, the writer attributes the difference in stability of roofs, although the heavy blasting and sometimes indiscreet placing of holes in stoping, no doubt, is contributory to the effect. Coming to the second reason, it is observed that the props used in longwall systematic timbering have a considerable initial resistance, whilst pigstyes used in stoping have practically no initial resistance; in fact their maximum resistance is not reached until they become compressed by about 20 per cent. of their original height. This amount of compression is observed at varying, but generally at considerable, distances from the face. The hanging wall is therefore supported at two points, namely, at the point in the stope where the pigstyes have reached their maximum resistance, and at the face. It therefore follows that fracture may be expected at and parallel to the face or in proximity to any pillar left in the stope. Practically, we have the phenomenon of "punching." The comments to be expected upon the above statements will no doubt be that there is no originality in them; secondly, that stope faces cannot be speeded up; and, thirdly, that props, notwithstanding their initial strength, are impracticable in deep level flat mines; and, finally, that as a cure seems impossible the trouble must be endured. The writer, of course, admits that the difficulties above outlined have been recognised, and that steps have been taken to combat them, and the remaining remarks refer to such improvements as have been already adopted and suggestions for further improvements.

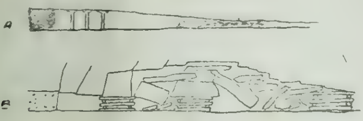

Fig 1

Improved Supports and Methods: Wedged Cogs.—The increase in initial resistance of a pigsty or cog has been to a certain extent effected by driving wedges into the split ends of the lagging of which the pigsty is built. This method is not so effective as might be supposed, and an improved method of wedging without splitting the sticks has been introduced. A split stick (half-round) is placed flat side down in about the centre of the cog. A long wedge of small taper is driven in below the split lagging and rests in a square joggle in the next underlying stick. By driving home these long wedges the whole of the upper portion of the cog is forced up to the hanging.

Masonry.—Well-built dry masonry has been used in preference to pigstyes. A pack 20 feet square with rounded corners is used. These packs, in addition to giving a good initial resistance, resist blasting better than the pigstyes. They are built by experienced masons, and the cost appears to be rather higher than for building cogs. The masons at

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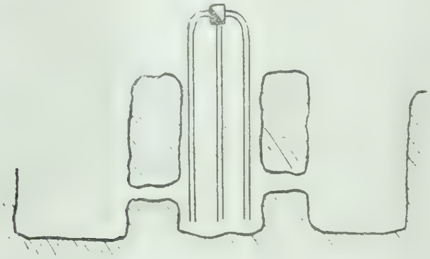
20s. per day handle about three tons of stone, which does not, however, compare very favourably with a surface mason's day's work of two and a half cubic yards.

Pillars.—The use of pillars in conjunction with the above-mentioned supports is the generally recognised practice, notwithstanding that even the greatest advocate of the pillar admits its disadvantages. In deep level mining it is difficult to demonstrate the utility of the pillar except under special circumstances, such as the support of faulted ground or in the process of the reduction of stoping widths. A method, comparatively recently introduced, known as the "Panel System," makes use of pillars regularly placed and subsequently removed. The system in conjunction with footwall crosscutting is illustrated in Fig. 2. It approximates to the pillar and stall method in colliery work, the stalls being from 70 ft. to 120 ft. wide with pillars of 30 ft. It is undoubtedly the best method of controlling roof weight in a stope where the face advances slowly, and it effectually obviates the dangerous condition mentioned in the earlier portion of this paper.



Suggested Improvements in Cog Construction.—The cog or pigsty has the great advantage over masonry in cost of construction, as comparatively unskilled labour can be used. It has the disadvantage of being easily damaged by blasting unless it is carefully built and unless the stope timberman and machine man work amicably, a condition which it is difficult to obtain in practice. Fig. 4 illustrates a design which should allow of good construction by an indifferent workman and should result in a pigsty which it would be difficult to blast out. Four posts are set in such a manner that the ends of the horizontal sticks do not project beyond them. Old wire rope is then passed round the posts as shown in the figure. These ropes are drawn as taut as possible, and finally tightened by means of twisting by the insertion of a piece of pipe or jumper at the point A. The frame is then filled with stone. Fig. 5 shows a similar construction, but using wire rope in place of the horizontal sticks. Fig. 3 uses old pipe filled with concrete for the posts. A plug of wood is used in the upper ends of these posts and answers two purposes. It allows of a certain amount of compression, and can be easily sawn to adapt the length of the post to the height of the stope. Wire rope is again used as in Fig. 5.

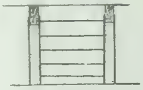


Fig 3

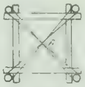


Fig 4

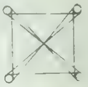


Fig 5

In conclusion, it may be mentioned that the question of the support of roof in the East Rand mines would be much more acute if it were not for the fact that owing to unpayability, almost half the area remains unmined. As more mines become worked, however, the roof must become more troublesome and the loy-out of underground workings and methods of mining which have been more or less satisfactory in the past will in all probability be found wanting in the future, and the writer makes this his plea for justification for placing these notes before the Society.

New Patents.

[illegible] Hudson Hughes.—An improved vaporiser for use with petrol engines and the like.

Arthur George Cooper and Richard Albert Arthur Ramsford.—Improvements in apparatus for transmitting, recording and reproducing telegraphic and telephonic signals.

Arthur Herbert Buckley and Reginald Alwyne Buckley.—Improvements in starting rheostats for electric motors.

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Company Meetings.

SOUTH AFRICAN TOWNSHIPS

An extraordinary general meeting of the shareholders of the South African Townships, Mining and Finance Corporation, Limited, was held in the Board Room, the Jeppe Arcade, Commissioner Street, Johannesburg, on Nov. 17, Mr. J. Jeppe, chairman of the company, presided. Those present represented in all 479,206 shares out of an issued capital of 600,373 shares.

The chairman said that at the annual meeting he stated that the directors were considering proposals of considerable magnitude with the object of extending the sphere of the company's activities. They had now been called together to consider the advisability of adopting these proposals. At that time the company had just acquired the Pretoria Estate and Market Company and the Pretoria Townships, Limited, these companies possessing between them very valuable assets and for the purpose of completing these transactions, they had authorised the increase of capital from £200,000 to £600,373, at which figure it stood at present. The result of the absorption of these two companies was to increase their assets from £463,129 at the end of 1917, to £1,585,817. That, it must be understood, was the book value of these assets and did not take into consideration the company's liabilities. In pursuance of the policy then referred to, the Board, after thorough consideration, had made an offer to each of the following companies to purchase the whole of their assets, namely: African Farms, Ltd. South African Gold Mines, Ltd., Rhodesia and Union Farms and Mines, Ltd., Malvern Estates, Ltd., and Suburban Township Company, Ltd. Before going into details as to these companies, he reminded the shareholders that at the extraordinary general meeting of the company held in March, they empowered the directors to increase the capital of the company up to £1,000,000 without further reference to shareholders, and to deal with the same as they thought fit. The board, however, though not requiring for this business as great a capital as the figure mentioned yet thought it desirable for various reasons to place the proposal before shareholders. The Board had not made it a condition that the whole of the companies should accept before any business was done, as they had considered the purchase of the assets of each of the companies upon its own merits and made an offer in accordance therewith. The chairman proceeded to give details regarding each of the company's concerned and the offer made to each company.

He gave the following value of the various assets so that shareholders might be in a better position to appreciate the actual effect of the amalgamation:

Total Amalgamated Assets.

	Book. value. £	Estimated market value. £
Farm properties	349,441	389,506
Farming ventures, live stock and vehicles .	66,721	67,798
Plantations, fencing, farm buildings . . .	7,070	10,380
Township properties .	399,755	728,495
House properties . .	112,330	121,360
Mining ventures . .	9,594	10,000
Share investments .. .	557,162	889,539
Bonds and loans, sundry debtors, cash .	843,260	843,260
	2,345,363	3,060,338

From the calculation they would see that they would then possess assets estimated to be worth about £3,060,338, out of which they would have to provide for total liabilities of about £604,465, against which they had liquid assets, namely, cash, bonds, loans and shares to the value of £1,732,799. The market value of their freehold properties had been conservatively estimated, for instance, in Waterkloof township, they had about 950 stands, the selling price of which was £200 each, but they had only been estimated at £100 each for the purpose of the second column, and the same had been done with their other township properties. The mineral rights which they would hold over 78 farms, totalling about 748,000 acres, which stood in the books at £1 per farm, had been taken at the same figure in the market value column. He had had an estimate made of the probable income of the company under these circumstances for the current year, and what he might term their steady sources of income, and the position was as follows—no account had been taken of annual expenditure of taxation—licence moneys, rents, etc., £43,000; dividends and interest, £73,000—£116,000. There was in addition to that the profits made on sale of shares, farms, stands and otherwise: it was, of course, impossible to estimate that with any degree of accuracy but it would certainly add very materially to your income. When these purchases had been completed, the issued capital would have been raised to £974,626 in £1 shares. As they were aware, a general meeting of shareholders had been called for next month to authorise the subdivision of shares into a denomination of 10s. each instead of £1.

Developing Townships.

It was intended to pursue the policy of opening up their townships, a policy which was very popular with those who desired to acquire a home, but who could not pay outright for one. There was no risk to their company in doing so, and every home that they established further developed and popularised their property. In the township of Waterkloof, for instance, there was a considerable demand for houses, and in that property they had a very valuable investment. This township being just outside the area of the municipality is free from rates and the company had established a complete reticulation system for the purest water, as well as an electric power station, for supplying the residents with light on favourable terms, and a motor 'bus service to and from the city. They also built a good road through the township and altogether had spent well over £[illegible] on its development. In addition, as they knew, they had laid out the well-known and popular Country Club upon the estate with its magnificent lake, golf course and other recreations. Apart from the area at present laid out, there were other parts of the farm which, when occasion arose would be turned into building plots; and on other portions of the farm, too far away, perhaps, for building purposes, they had established plantations which would eventually become a valuable asset. They would have a very large holding in the Leeuwpoort Tin Mines, which, up to date, had paid 27 per cent. in dividends. Unfortunately, the influenza epidemic at the end of last year affected the labour supply very seriously, and the mine was only just resuming normal labour conditions. As a consequence of that visitation and the expenditure of a considerable amount on additional plant, air compressors and smelters, etc., no dividend had this year been declared, but there could be no doubt as to the resumption of dividends at an early date. He would also like to mention that they had an appreciable interest in the Pretoria Cement Company, one of the premier industrial concerns of the country, and also in the Pretoria Iron Works, the potentialities of which were enormous. With their liquid assets standing at £1,127,555 over all their liabilities, there was no doubt that their resources would be equal to any proposition mining, industrial or otherwise which might be placed before their Board, and their company would in future be able to take a greater part than hitherto in the mining and other development of the country. The only thing this country wants, said the chairman in conclusion, to go ahead and to go ahead quickly is peace, political and social peace; after this devastating war and the ruined condition in which it left the producing power of Europe, the first country which settles down to production of all kinds with all its energy and unabated attention will reap the greatest and the most permanent benefit. All this goes to support the view that your company ought to have a bright and prosperous future. It will have a capital less than a million sterling with an assured steady income of about £120,000 a year, without counting profits from other sources, and possessing great possibilities with regard to its mineral rights and share holdings. It is also bound to share in the increased value of both farming and urban land, so that taking all things into consideration, I am surely not venturing too much when I express my conviction that by the end of the year, our company will have re-entered the ranks of consistent dividend payers.

Resolutions embodying the proposals were then put and adopted.

FRANK SMITH DIAMONDS.

The ordinary general meeting of the Frank Smith Diamond Estates and Exploration Company, Ltd., was held on October 23, at Winchester House, London, E.C., under the presidency of Mr. E. Tuik.

Mr. W. Bailey (for Johannesburg Consolidated Investment Company, Ltd., Secretaries) read the notice calling the meeting and the auditors' report.

The Chairman: Gentlemen, this is the ordinary meeting of the company. The business before us is the passing of the accounts, the re-election of the directors and the auditors. The important business, namely the proposals for the reorganisation of the company, will be dealt with at the extraordinary meeting which will follow the ordinary meeting. I propose to deal with the position of the company at some length at that meeting. With regard to the accounts which are before you, they do not call for much comment. Our expenditure for the year has amounted to £5,204 15s. 7d., against which there has been a small revenue from rents, etc., £579 5s. 9d. In other respects the accounts are practically unchanged as against the previous year. I now beg to propose that the accounts, etc., be adopted.

Mr. A. H. Stephenson seconded the resolution, and it was carried unanimously.

The Chairman proposed the re-election of Mr. A. R. Stephenson as a director, remarking that he had been a great help to them right through in connection with the companies with which they were associated, and also in connection with the reorganisation of the company.

Mr. A. A. Knight seconded the motion, which was unanimously agreed to.

Mr. Stephenson then proposed the re-election of Mr. E. Tuik as a director.

Mr. Knight seconded the motion, which was carried unanimously.

The auditors (Messrs. Cooper Brothers and Co.) were re-appointed.

EXTRAORDINARY MEETING.

An extraordinary general meeting was then held to consider a resolution to reduce the capital and to alter the articles of association.

The Chairman said: Gentlemen, in proposing the resolutions which we have just heard, I have to explain to you briefly the sequence of events which have led up to the scheme of reorganisation which we submit for your consideration and adoption. You will remember that about a year before the War, the new treatment plant which had been erected at the mines commenced operations. The plant did not at once give the satisfaction which the directors had good reason to anticipate. A great deal of adjustment was required and it was only about June or July, 1914, that anything approaching normal running was achieved, and even then it was found that to attain the capacity of 4,000 loads a day, which had been originally contemplated, further alterations and additions to the plant would be necessary. The War broke out, and having regard to the uncertain outlook and the company's financial position, the directors had no choice but to close down, a step which very soon after had to be adopted by the big diamond mines also. We had to remain in the position of inactivity during the War, and until the present moment. That we have been able to weather the storm and are able to meet you to-day with our property practically intact is due to the assistance which the company has received from the Johannesburg Consolidated Investment Company, Ltd., in conjunction with Messrs. Barnato Brothers and my own firm. Owing to the financial help given by them we were able to pay off pressing creditors, to keep up the payment of claim licences and taxes to the South African Government, the non-payment of which would have led to the forfeiture of the company's mines, and to provide for the proper protection and caretaking of our buildings, machinery and plant. Expenses were cut down by us to the lowest possible point, but it was impossible to reduce the South African outgoings to less than about £3,000 per annum, as Governmnt licences, rents, etc., alone amounted to over £2,000 per annum. On the advances made to us by the Johannesburg Consolidated Investment Company, Ltd., we were charged only 5 per cent. interest, certainly an exceedingly reasonable rate of interest, seeing that the Government raised loans giving a higher yield. At the end of the War it became clear that the position of the company had to be dealt with in some way or other. The financial arrangements which we had been able to make gave us funds to about the end of this year, and the termination of the War meant that we would have to make provision for meeting the company's accumulated liabilities, which amounted to approximately £40,000. When we discussed the position in the early part of the year, the Treasury restrictions were such that it seemed impossible to obtain the money in this country. We, therefore, asked our South African directors to take the matter in hand, and negotiations lasting several months culminated in June last in the proposals which are set out in the resolutions. Before they could be put before shareholders it was necessary to obtain the consent of the Treasury, which, after some delay, has been obtained, and to prepare the revised articles of association. During the last few years a considerable number of shares in the company have been acquired by South African holders, and under the guarantee of the new capital the South African interests in the company will probably increase further. The proposals made from South Africa contained, therefore, a stipulation that a new company should be formed, with its head office in South Africa. This would have brought the company into line with practically all the other diamond and gold mines holding properties within the Union of South Africa. On submitting the matter to our lawyers, we were advised, however, that there were legal obstacles to carrying this out, and it was thereupon agreed with the South African guarantors of the new capital that the difficulty should be got over by leaving the English company in existence, but making such alterations in the articles of association as would bring the company for all practical purposes into the position of a company registered within the Union of South Africa. This change will entail that the direction and control of the company's South African business will be exercised exclusively by a local board in South Africa, and that the general meetings will be held in South Africa. I think it must be conceded that, having regard to all these circumstances, the request of the South African holders is a reasonable one, and we have felt bound to meet it as far as we can reasonably do so. The alterations in the articles of association, which are before you, are, to a large extent, for the purpose just stated, but we have taken the opportunity of modernising our articles in a few other respects. Mr. Crisp, our solicitor, who is present, will be able to answer any questions on the subject. Amongst the alterations which we have inserted, there is one important one to which I wish to draw special attention. Up till now the notices to be given of any ordinary or extraordinary meeting was fixed at seven days. In order to meet the changed conditions we have provided for a notice of 60 days. This will give shareholders in England and South Africa ample opportunity to receive the annual reports, to digest them, and to convey their approval or dissent to the general meetings of the company. The scheme of re-organisation is so fully set out in the resolutions that it hardly requires any further explanation on my part. The new issue has been underwritten free of any cash commission, the consideration being the right to the guarantors to subscribe for the reserve shares of the company at 7s. 6d. for a period of three years. The scheme will provide a sum of about £100,000, sufficient to discharge all liabilities, and will leave about £60,000 in hand for working capital, and, if the options are exercised, another £100,000 will come to the company at a future date. In conclusion, I wish to express the board's confident hope and belief that the work which is to be undertaken will lead to profitable results and to dividends in the near future. The work carried out during the 13 months prior to the War, when over 550,000 loads were treated, has proved that we have a 3·9 carat proposition, and we are assured that our diamonds, which in 1914 realised about 60s. per carat, are worth to-day from 50 per cent. to 75 per cent. above that price. There is, therefore, good reason to expect that the company will now enter upon a successful future. I move the resolutions for the reduction of capital from £300,000 to £199,078 by cancelling capital lost or unrepresented by available assets to the extent of 3s. 9d. per share, thus reducing the nominal amount of each share from 7s. 6d. to 3s. 9d. The other resolution was for altering the articles of association.

Mr. Stephenson seconded the resolutions, which were carried unanimously.

The proceedings then terminated.

The Secretary for Finance on the Gold Question.

Mr. E. H. Fraser, Secretary for Finance, was examined during the week by the Low-Grade Mines Commission. He reviewed the position with regard to the sale of gold, saying that the most important proposal which had been made was that the Union should itself provide a free gold market, establish direct exchanges with the countries with which it traded, and free itself from the disadvantages of the depreciation of sterling currency in relation to the currencies of the United States of America and certain other States. The establishment of a free gold market in South Africa at the present time would mean a continuous flow of sovereigns from the Union, replacement of which could only be made at a cost of 23s. 6d. the sovereign. That would necessitate increasing the charges for remittances to the Union, which would react seriously on the mines themselves. Having commented upon Mr. D. C. Greig's scheme for the disposal of gold in the Union, witness stated that the feasibility of establishing direct exchanges depended on the amount of trade done with individual countries and it was doubtful if with the exception of the United Kingdom and the United States of America the trade between the Union and any other country was large enough to permit of an economical system of direct exchange. Settlement of accounts through the United Kingdom when the exchanges were against sterling affected the Union adversely if the balance of trade was against the Union and benefited the Union if the balance of trade was in favour of the Union. Conversely when the exchanges were in favour of sterling it benefited the Union if the balance of trade was adverse. Thus the Union suffered through settling through London with the United States of America, India, Holland, Sweden, the Argentine, Switzerland, and benefited through settling in London in the case of Japan, France, Germany, Italy, Portugal, Brazil and Chili. As a general rule, South African trade with other countries resulted in an unfavourable trade balance, consequently the exchanges would be adverse to the Union in the great majority of cases. The high premium on the dollar in relation to other currencies must result in the United States of America reducing prices or losing much of her export trade. So long as the premium on the dollar existed the gold mines could command a high price for their gold, and the present selling arrangements appeared to secure the highest possible price. When the premium on the American exchange disappeared there would still in all probability be a small premium on gold for India, but gold would generally be sold at the standard price. When that happened the best price for gold would be obtained by minting it locally.

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Notes and News.

Some Controversial Questions.

Several burning controversial industrial questions are dealt with in this issue, and it does seem that the world's ferment is producing its effect in our midst and in the most unexpected places. Thus we have several of the leading electrical engineers of the Rand starting out to attack the policy of the V.F.P. as being inimical to the progress of electricity in this centre. Then we have a leading consulting engineer taking advantage of the opportunity of giving evidence before the Low-Grade Mines Commission to voice the well-known feeling held largely, if not generally, on the Reef, that the Chamber of Mines has given way too much to the labour people, with a resulting loss in labour efficiency. There is a lot to be said, of course, on both sides, and it is not for us to rush in with opinions where those most competent to judge are themselves so divided. The last, assuredly, has not been heard on the subject. Then there is the diamond question, in regard to which our morning contemporary has lashed itself into a fury. The Government's action is bound to come up for review in Parliament, and we must be content to await a fuller ventilation of all the facts than they have apparently yet enjoyed.

* * * *

Sluicing for Gold on the Rand.

Sluicing for gold in the mines of the Rand sounds like a novelty, but it seems destined to play a very practical part in gold recovery. Speaking of the Van Ryn Deep this week, Mr. John Munro said that special attention is being given on that mine, and for that matter on all the mines of the group, to the careful and systematic washing of the stoped-out areas. It has been found that with the copious daily washing down that is necessary under the Phthisis Regulations a considerable amount of concentration of gold has been taking place; and this gold is recoverable only by a system of sluicing. It is clear that, no matter how thoroughly stopes are cleaned out by shovels and brushes, there is still left a considerable quantity of high-grade fines which can only be recovered under strong pressure of water. Careful records are kept, and from the results achieved on the various mines of the "J.C.I." group this systematic washing of stoped areas is not the least important feature of the year's work. That it will be extended to other mines of the Rand goes without saying, since conditions in this respect are generally so similar.

* * * *

An Association of British Manufacturers.

A meeting has been called for Thursday, December 4th, at 2.30 p.m., at the Chamber of Commerce for the purpose of forming an Association of British Manufacturers and their representatives on the lines of those already in existence in Australia, New Zealand and Canada. The promoters of the enterprise are representative of all classes of British manufacturers in all trades, and sufficient support is assured to ensure the formation of a strong, live and useful body. A similar meeting will be held at an early date in Capetown.

* * * *

The World's Biggest Electric Winders.

Randfontein Central, according to Mr. John Munro at the annual meeting of the "Johnnies" Company, is to have the world's biggest electric winders. They are to be capable of raising a net load of five tons each from a depth of 5,000 ft. at 4,000 ft. per minute. It will be recalled that the Crown Mines winders, which have hitherto held the record, can raise 8 tons net some 3,500 ft. at the same speed, so that there is little to choose between them and those to be put in at Randfontein. We have made enquiries as to who will supply the new winders, but can learn nothing beyond the fact that an American firm is likely to be successful in tendering for the electrical part and a British firm for the mechanical part.

The V.F.P. in the Pillory.

An interesting discussion took place on Thursday evening at the monthly meeting of the S.A. Institute of Electrical Engineers, in regard to the attitude of the V.F.P. towards the growing power requirements of the Rand. The company came in for severe criticism in respect of its financial policy, which, of course, is directed from London, and not always apparently in the best interests of the Rand as a progressive industrial centre. A report of the discussion appears elsewhere in this issue.

* * * *

The Year with the "Goldfields."

The Consolidated Gold Fields of S.A., Ltd., have received the following cable from their London office regarding the company's operations for the financial year ended 30th June, 1919: "The realised profit on the year's operations is largely derived from dividends received on investments, and after deducting debenture interest and all outgoings shows a balance to credit of £544,180 9s. 11d., from which the dividends on the first and second preference shares, French, South African and American Government taxes have been provided, leaving £388,961 19s. 6d. Against this profit a depreciation of £194,355 5s. 4d. has been charged in order to reduce holdings to market price in the case of quoted securities or to their estimated value in the case of unquoted securities. To the remaining balance of £194,626 14s. 2d. has been added the sum of £60,094 19s. 7d. brought forward from last year, showing an available balance of £254,721 13s. 9d. The directors recommend that a cash dividend of 7½ per cent. free of income tax be paid on the 2,000,000 ordinary shares, amounting to £150,000, leaving £104,721 13s. 9d. to be carried to the credit of the current year's profit and loss account." The annual general meeting of shareholders has been fixed for Thursday, 4th December.

* * * *

The Natal Coal Trade.

The Natal output for August was abnormally low, amounting to 172,300 tons only, as compared with 196,825 tons in August, 1918, and showing a reduction on the previous month of 30,000 tons. Special efforts (says the *Standard Bank Monthly Review*) have lately been made by the Railway Department to place coal at Durban, and the September output increased to 233,809 long tons compared with 196,377 tons in the corresponding month of last year, the tonnage shipped amounting to 108,166 (long tons). As emergency measures the despatch of coal from Union Collieries to Capetown was suspended, and the acceptance of general merchandise temporarily restricted, notwithstanding which, however, some steamers had to be sent to Delagoa Bay for coal, and in one or two instances left in ballast instead of with a cargo of coal, as had been arranged previously. The total sales of coke for August and September amounted to 1,474 and 1,355 short tons respectively, compared with an average output of 1,799 short tons for the five months to the 30th ultimo.

* * * *

Mr. Burton on Coal and Railways.

Speaking at Klip River last week, Mr. Burton, the Minister of Railways, said that he had already announced the Government's intention of introducing as early as possible a broad and bold policy of railway extension by the opening up of the outlying districts. Meanwhile they would be interested to learn that consideration was now being given to a comprehensive scheme of improvements on the existing lines, to enable the Administration to handle economically and expeditiously the heavy traffic that had developed during the War, and the much heavier traffic that was going to follow. The prospects had never been brighter agriculturally and industrially, particularly in Natal, which had an asset in her coalfields that was not sufficiently appreciated in the country at large. There was every reason to look forward to a period of prosperity and development. The country was favourably placed financially and geographically, and as regards raw materials and unskilled labour. Europe was calling for raw materials and foodstuffs. There was a famine in Europe in many commodities, including coal. There was therefore an opportunity of building up a considerable coal trade and a great improvement in output seemed sure as soon as the railways could get the equipment to handle it. They were doing their best in that direction, and putting their house in order in all respects, but much expenditure was entailed, not only in opening up new districts, but in enlarging the capacity of the existing railway lines. The traffic of the Natal railway system had increased from 3,000,000 tons in 1900 to a little over 5,000,000 tons in 1917, and 5,500,000 tons in 1919. Large improvements were under way on the Natal main line and the Natal North Coast line, and further surveys were being conducted with a view to still further increasing the capacity of the main line north of Maritzburg, since, at the present rate of progress, the capacity of the new line would be reached shortly after completion of the new works. For that reason the electrification of some parts of the Natal line would soon become an urgent necessity.

* * * *

Globe and Phoenix Takes a Drastic Step.

The secretary of the Globe and Phoenix has issued the following circular, dated October 15, 1919: "Mr. D. P. McDonald who, as you are aware, has been advising the board on the development of the mine, has now returned to England, together with the general manager, and the directors have had long consultations with them. A summary of a report from Mr. McDonald has already been communicated to the shareholders in the circular dated August 14 last, and I am now instructed to forward you the following information. The work referred to in the above circular is still in progress, but nothing of a definite nature has yet resulted; that done in the north end of the mine and at a depth has been disappointing, while on the other hand that being done elsewhere has been more promising. Development at the northern end of the mine has been suspended. In the large southern area where a very limited amount of work has hitherto been done a comprehensive programme of development has been laid out to test the position and a contract has already been entered into for prospecting by a diamond drill. This work and a thorough exploration of the mine for new sources of ore (which, having regard to its past history, the board feel it imperative, in view of the advice given them, to undertake) will require a considerable expenditure of money and even under the most favourable circumstances some time must elapse before any new ore will be available for crushing. At the last annual general meeting the chairman referred to the question of the ore reserves, particularly with regard to the excess produced over the estimated figures, and stated that a re-valuation was to be made. This has now been done, and the board are advised that the sources from which this excess was obtained are practically exhausted and that the value of the ore reserves at June 30 last was 143,333 tons containing 213,961 ozs. which, taken on the old basis of 4 guineas per oz. of fine gold, equals £898,636. Some additional ore may still be obtained as stoping proceeds, but it is impossible to estimate the amount. In view of the above facts and also of the limited amount of the ore reserves immediately available for crushing (owing to a large tonnage being in pillars) the tonnage crushed will automatically fall to about 5,000 tons per month. This rate of production is unlikely to provide any surplus out of which dividends could be paid for some time unless a fresh body of ore is struck. Any results of the exploratory work in progress will of course be communicated to the shareholders in the ordinary way by the monthly development cables. The board desire to give the shareholders an opportunity of discussing the situation and elucidating any point which may appear to them to be obscure or as to which they desire further information and for that purpose are calling an extraordinary general meeting as per notice enclosed herewith. Mr. Haddon and Mr. D. P. McDonald will be in attendance."

TOPICS OF THE WEEK.

A SUCCESSFUL GROUP.

Many interesting points were brought out at the annual meeting of the Johannesburg Consolidated Investment Co., Ltd., this week. The company, as is well known, is more than a mere finance or "holding" concern. It owns large real estate interests, it conducts an increasingly important financial business, and it administers one of the largest and most important groups of mines on the Rand. It is with the last-named that we are mainly concerned here. First, it will be noticed with regret that Mr. Imroth, the Managing Director, who has had forty years' experience in this country, is saying, as he himself put it, "au revoir" to the Rand, and is going to the London office. Fortunately his place will be taken—temporarily at any rate—by another strong man in Professor Lawn, whose high technical qualifications peculiarly fit him for the control of so important a group of mines. All too seldom on the Rand is a purely technical man advanced to the highest posts in the industry, and had it been otherwise we might have been spared the impatience voiced by Mr. W. L. White, before the Low Grade Mines Commission this week, with the policy towards labour of the financial and administrative heads of the industry. The financial position of the company as shown by Mr. Munro, is one of record strength, and with the plans of the subsidiary companies gradually coming to fruition this is bound to be further improved upon in the future. Of the mines, the Government Gold Mining Areas maintains its excellent position, and the prospects were described by Mr. Munro as never brighter than at present. Splendid progress is being made at Randfontein, and the two electric winders to be installed at the deep level shafts will probably be the biggest of their kind in the world, though run pretty closely by those at the Crown Mines. All the mines of the group have suffered from the prevailing acute shortage of native labour, particularly, Randfontein, Langlaagte Estate, "Knights," and—despite its popularity with the natives—the Government Areas. At the New State Areas, however, excellent progress is being made. Information obtained from adjoining properties shows that the reef will be struck at a lesser depth than indicated last year, and it is anticipated that the reef will be intersected in both shafts within a year from now. It is the intention to obtain the first instalment of the reduction plant as soon as the reef has been struck, and every effort will be made to have it erected within twelve months from that date. It is obvious that the shareholders' interests will best be served by bringing the mine to the producing stage as early as possible. "In view of the satisfactory developments in the adjoining mines," (said the Chairman) "we have every confidence that this company will prove highly profitable." The Chairman also showed that results from the Van Ryn Deep have been eminently satisfactory during the year. "There has been a steady increase in the tonnage milled and in the monthly profits. The amount of development work carried out per month has also been increased, whilst the value of the reef exposures have been excellent, and for the last quarter the inch-dwts. of the payable reef exposed have been the highest in the history of the mine. There has been a little capital expenditure on providing the two underground winding engines with new electrical parts. This work has now been completed and the engines are giving every satisfaction. With the increased tonnage now being milled and the improvement in grade, the area of the amalgamating plates is scarcely sufficient. It has, therefore, been decided to add additional plates." A bonus distribution of the 150,000 shares held in the New State Areas will brighten the shareholders' end of the year outlook; and the company is heartily to be congratulated on the material improvement in its position and prospects. In regard to the diamond interests of the "J.C.I." it will be seen from the full report of the speeches printed elsewhere in this issue that Mr. Imroth is thoroughly satisfied with the results of the recent conference. In every respect, therefore, and taking into consideration the difficult times in which we live, the board of the "J.C.I." are able to render a splendid account of their efforts to their shareholders in this country and overseas.

Sir Lionel Phillips' Views on the Industry.

The *Agence Economique et Financière* publishes a long interview with Sir Lionel Phillips, who is passing through Paris, concerning the future of the gold mines of South Africa in relation to the premium on gold. Sir Lionel Phillips says that the premium on gold permits one to take a rosy view of their future. The annual output of the South African gold mines amounts to £35,000,000 in round figures, and the premium on this amount is a net additional profit, subject only to the deduction of 10 per cent. of the premium as the Union Government tax. For mines like the Crown Mines the premium will represent an additional profit of £30,000 to £35,000 per month. In the opinion of Sir Lionel Phillips, the low-grade mines will now make profits, instead of a loss, and the other mines will have their profit considerably increased. Those mines that in the last few years, owing to difficulties, have been working high-grade ore will in future be able to crush ores more in keeping with the average grade of their reserves, as well as, at the same time, increasing their profits. Replying to the question of the representative of the *Agence Economique et Financière* whether this would prove to be a substantial factor in the rise of price of shares, Sir Lionel Phillips replied: "At the present moment one would be inclined to take the view that an increase in price would be justified." He added that competent opinion takes the view that the rates of exchanges will tend to ensure the maintenance of the premium on gold for at least ten years. Without going so far himself, he said that one could at any rate safely hold the opinion that it would last for a considerable time. Sir Lionel Phillips thinks that labour difficulties will be solved when miners' phthisis has been overcome by the methodical use of Lister's serum, which will assuredly lead to the complete disappearance of this fell disease. Then the conditions of the mines will be improved in a quite extraordinary degree. He is of the opinion that the extreme richness of the Far East Rand has been fully demonstrated. He stated that at Modderfontein East there are now 800,000 tons of ore in view, giving an average yield of 32s. per ton, or 37s., if allowance be made for the premium on gold. The company will begin to produce in about eighteen months.

* * * *

Advertising South Africa.

An Overseas Advertising Conference met this week under the chairmanship of Sir Wm. Hoy, who explained that the suggestion for the conference had come from the Cape Publicity Association, and the Minister of Railways approved of it. He wanted to see a well-conducted publicity scheme commenced, the money well spent, and a united policy receiving the support of the Government, the railway and public bodies interested in the question so as to make South Africa attractive to people who wished to visit it. South Africa and its conditions were not known in Great Britain, America, Australia, or Europe, and it was time that her position as an important Dominion of the Empire should be made known. Our progress had been rapid, and it was essential that we should take our place beside other great countries of the world. The fact that a sum of no more than £35,000 is likely to be forthcoming from the Union Government for this purpose is rather discouraging. The following figures give some idea of what has been spent in national advertising: From June 9 to July 12 last, the British Government spent, in the United Kingdom, on advertising the Victory Loan, £172,000. At the present time, the linen manufacturers of Ulster have subscribed £90,000 for the purpose of advertising Irish linen in the United States. The City of Manchester has also gone in for a big publicity scheme in America, to bring the advantages of its port to the notice of shippers in that country. For this purpose, they have been placing full-page advertisements in 19 of the largest papers in the United States. These advertisements deal largely with the Manchester Ship Canal. In addition to this, manufacturers in Manchester have also been placing large advertisements in the same issues, drawing attention to their wares.

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POWER COMPANY'S POLICY IN THE PILLORY.

Important Discussion by Rand Electrical Engineers—Why Steam Winders are being Put In.

At the last meeting of the S.A. Institute of Electrical Engineers, Mr. H. W. Clayden strongly criticised the policy of the Victoria Falls Power Company, and he was supported by the President, Mr. Du Pasquier, Mr. Kirkland, and others. In the course of a paper on power supply from the standpoint of the mining concerns, Mr. Clayden said: " To maintain a load factor of 70 per cent. electric hoists cannot be worked until the reduction plant is operating, and I think it is chiefly due to this cause, that on all new shafts at present being sunk on the Far East Rand steam winding has been adopted.

Cost of Supply.

" The cost of supply is the next item. I am quite aware that it is considered good practice from a power supply point of view to adopt the maximum demand method of charging and that each consumer should first pay the capital charges, interest and depreciation and stand-by losses on the maximum kws. of plant used by him at any time during the month plus a small figure of about 0.2d. per kw. hour for generation costs, which is the basis of the existing schedule of load factor charges. But on the other hand, I think that the diversity factor of the whole system is not sufficiently considered in the base rate charge of 0.525d. and this is all to the advantage of the Power Company.

The Wrong Policy.

" The maximum demand system of charge is undoubtedly useful in keeping down plant capacity on small undertakings. But in a condensed power supply area like the Witwatersrand, roughly 60 miles by 2 miles with two out of four main power stations situated practically at pit's mouth and an efficient distribution system, it seems wrong that chiefly owing to this system of charge it is cheaper for the large consumer to use steam power, the coal for which costs in railage alone approximately twice as much as the pit mouth price, or three times the cost at the power stations in addition, the small steam plant probably uses 1½ times the weight of coal per kw. hour, or in other words, the coal cost per kw. hour is from 4.5 to 5 times that of the Power Company's two stations which are working full time, and about three times that of the Power Company's two peak load stations. This seems wrong, when each time one picks up a home paper we read of the large national saving in coal and cheap cost of power that is expected from the large power stations situated on the coalfields of England.

The Real Saving.

" When the Power Company first commenced operations it was definitely stated that the saving due to electrification of all plant on the mines would be between 6d. and 1s. per ton crushed. The average figure on the two mines is 2d. per ton crushed in favour of the electrified mine when purchasing power at 0.525d. on a 60 per cent. load factor due to a group factor of 70 per cent., and the other mine still running the old steam plant of 20 years' standing, both mines crushing the same tonnage. This figure does not include the cost of the air supply."

Steam Plant Should be Excluded.

" In conclusion it would seem that to obtain general use of electricity on all new mines two flat rates of charge, one for electrically-driven compressor plant and the other for all other electrical plant will be most beneficial to the consumer and if the price charged can be brought down to a figure to exclude the use of steam plant, the resident engineers on the mines of the Rand may live to enjoy a happy old age."

The President's Criticism

Mr. Du Pasquier followed, and said " Mr. Clayden's paper constitutes a very clear exposition of the way universal electrification is being hampered at the moment by what one cannot help feeling are artificial restrictions. Burning coal to run individual winding engines or compressors in the present age, and under our local conditions with our advanced state of development is putting back the hands of the clock of Progress, because if steam can be justified now by reason of the prevailing scale of charges for electrical energy, one cannot imagine that, in the course of the next few years, though no doubt a more attractive rate will eventually prevail, that the rate can be made so attractive as to warrant the double capital expenditure involved by conversion. It is difficult to disprove Mr. Clayden's contention, although I admit I have crossed swords with him on this very point a few years back, that steam is in certain cases, notably winding engines and compressors, justifiable now by reason of these penalties for the inevitably decreased load factor. It is interesting to note here that equalising a winder by means of a flywheel, though cutting off the peak load of the winder altogether, would not benefit matters.

Penalty Cases Cited.

" In addition to the instances quoted by the author I have recently come across two cases, in one of which the running of a large electrically driven compressor involved a penalty of £5/600 a month, and in the other the installing of an electric winding engine would involve penalties of the order of £300 a month, I suppose every member here tonight has had similar experiences. The advantages of the electric winder are thoroughly well appreciated to-day, it is recognised as the correct solution, and yet as the author points out, State Mines, Van Ryn Deep and Springs are steam winding, and New Government Areas, Springs West, and Springs are sinking with steam. There is surely something radically wrong. It is I think conceivable that what

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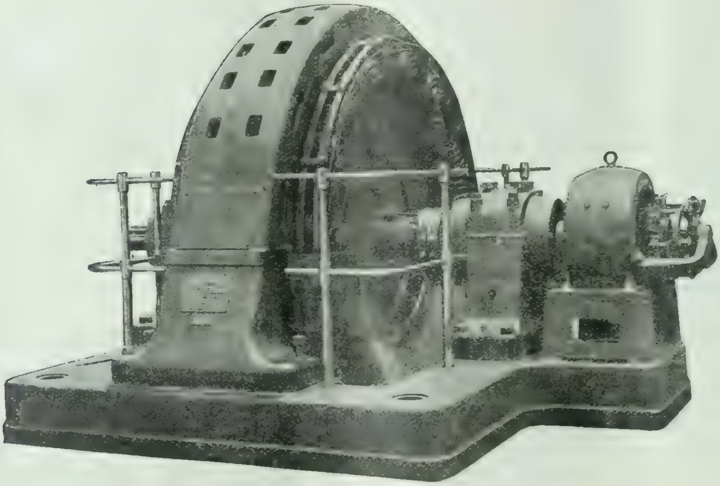

2 PEDESTAL BEARING ON BED PLATE TYPE ALTERNATOR
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may be apparently technically correct is not always practically expedient. Too narrow a view may be taken of the possibilities of increased output

THE ATTITUDE OF THE V.F.P.

" As electrical engineers, and as men generally interested in maximum efficiency and the preservation of National assets, one cannot but regret that the attitude rightly or wrongly adopted by our big power supply company, has had the effect of condemning consumers to adopt methods which they know are not from a technical and practical point of view best suited to their requirements, or in the real interest of the country at large. Sound or unsound I venture to think it is a policy that cannot persist. On the Far East the only new development able to avail itself fully of the advantages of electrification is New Modder, who enjoy the benefit of the flat rate, in the Far West Randfontein, with their own-power supply. The inevitable result of pursuing this penalty for load factor policy will be the growth of other power stations, group owned, on the Far East Reef, which from a broad point of view would be undesirable.

DELAY DEPLORABLE.

" I have no doubt that the pressure of this possibility will bring about some appreciable tariff modification, and if my opinion is justified by results, then it is deplorable that it has not been done before. If it becomes by reason of competition commercially expedient in 1920, how much more so was it in 1913? Nobody is more appreciative of the wonderful service the V.F.P. Company gives or of the engineering skill and ability that distinguish their staff than myself, and it is not pleasant for me to criticise their policy, and were I not occupying my present position I might not do so. I am also familiar with the argument that increased peak load means more generating plant, and the capital charges of such must be paid for by consumers. We also like to see them prosperous and paying dividends. The more prosperous they are the more hope we have of getting more attractive tariffs, but capital charges on a 50% load factor do not amount to more than, roughly, .15d. per unit, or allowing for distribution, etc., say .2d., and if generating costs are .2d. per unit as Mr. Clayden states, it would seem that a flat rate of .525d. per unit down to a 50% load factor was possible apart from the broader aspects of the case."

MR. KIRKLAND'S SUPPORT.

Mr. J. W. Kirkland followed the President in a speech of characteristic eloquence, and strongly condemned the policy of the V.F.P. directors, while paying a high tribute to the talented engineers of that company.

Mr. Ottley read a brief reply, in which he stated that the criticisms of the evening would be fully answered at the proper time and in the proper place. He questioned the Institute's right to discuss the matter at all.

Professor Buchanan dealt very forcibly with Mr. Ottley's objections, and Mr. Graham concluded the debate by supporting the majority.

The directors of the Premier Portland Cement Company (Rhodesia), Ltd., have declared a dividend of 3s. per share, being the first dividend at the rate of 10 per cent. per annum, for the period ended the 31st October, 1914, on the cumulative preference shares of the company.

Considerable activity in asbestos mining is reported from Rhodesia. There is a large demand from London and Japan, and the mines have sales for all they can produce of all classes of fibre. The discovery of a large lime deposit in the vicinity of Victoria, Rhodesia, is reported. Enquiries are being received for chrome, of which the output from Rhodesia is steadily maintained.

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IMPORTANT SILVER AND BASE METAL FLOTATION.

Old Transvaal Mines Resuscitated—Rich New Discoveries—Guaranteed Issue Offered to the Public at Par—Promising Industrial Enterprise—Fathered by General Mining Corporation.

Quite one of the most important mining flotations of recent years will, we understand, be launched in the next few days under the auspices of the General Mining and Finance Corporation. The new enterprise will be known as "Transvaal Silver and Base Metals, Ltd.," and a company of that title has been registered at Pretoria, with a nominal capital of £70,000. This is divided into 70,000 shares of £1 each, of which 35,000 fully paid shares go to the vendor, the General Mining and Finance Corporation, and 35,000 will be offered to the public in the Union at par, payable in full on application. The vendor has guaranteed the whole of the public issue at par, in consideration for an option for a year from January 1st next, to subscribe for further shares in the Company up to 35,000 in number, at 25s. per share. All subscribers to the present issue of 35,000 shares will receive a similar option. The list will close on December 15th, and the terms certainly seem fair to all concerned, and likely to prove most attractive to investors.

Directors and Administration.

The Directors of the Company are all well-known and experienced mining men, and include Sir George Albu, Bart., and Messrs. Arthur French, Erroll Hay, G. G. Holmes and Comte de Ferrieres. Mr. Oliver King, the well-known engineer, is the Consulting Engineer, and the Company will be administered under the aegis of the General Mining people.

The Objects.

The principal objects for which the Company has been formed are "to acquire from the vendor, the General Mining and Finance Corporation, Limited, the freehold of two portions of the farm 'Dwarsfontein' No. 145, district Pretoria, in extent 18 morgen 450 square roods, and 7 morgen 487 square roods respectively, and all the rights, benefits and obligations as held by the vendor under certain prospecting contracts, with options to lease or acquire the silver, copper, lead and base metal rights over certain other properties in that neighbourhood on which there are lodes carrying ores of silver and lead; to recover and recondition various shafts and workings on certain of these holdings and carry out wide development in preparation for the installation of reduction and concentration plant for the production of high-grade concentrates, which may either be shipped to Europe for realisation, or may be smelted locally; to explore and prospect the various lodes and their extensions on the whole of the areas held with a view to locating further centres for mining operations." These properties are regarded as the most promising on the mineral belt, and a full account of the lode occurrences on the various holdings, and of the past workings on them, has been prepared by Mr. Oliver King, M.A.I.M.E., both from personal knowledge and from the available records and reports of past operations. The holdings are classed as: (a) Five more or less developed mines which may be quickly reopened and extended in preparation for the installation of concentration plant, and for early production; (b) areas totalling about fifty square miles held for prospecting and exploration, on practically all of which lode outcrops occur and lead-bearing ore has been found. The following old workings are embraced under the first category: (1) The two mines of the late Transvaal Silver Mines, Limited, on Dwarsfontien No. 145; (2) the properties developed by the late Witpoortje Syndicate, Limited, on the farms Boschpoort No. 336 and Brakfontein No. 219; (3) the workings of the late White Swan Copper (Argentiferous) Company, Limited, on the farm Oudezwaanskraal No. 537.

Work Done.

The most extensive development was carried out at the No. 1 Mine (west lode) Dwarsfontein, and from 1892 to 1895 the output recorded as exported had an intrinsic value of £160,000 and yielded a moderate profit. At the present day prices of lead and Silver, this output would have an intrinsic value in excess of £400,000. Only rich ore then paid for treatment, and large blocks of unstoped ore still stand above the old levels. From the No. 2 mine (east lode), Dwarsfontein, no mining was done, and a large block of unstoped ore will be available when the mine is recovered. The workings on Brakfontein were confined to one point on a lode which is traceable at surface for several thousand feet. This was dewatered in 1907, and the 140 feet driven at the 120 foot level was found to have a milling value of over £7 per long ton at to-day's metal prices. Little is known of the workings on Oudezwaanskraal, where considerable sinking and driving was done in 1890, but high grade silver ore can still be picked up on the dumps. The rights over the remaining properties have been acquired for prospecting and exploration as being adjoining and on the strike extensions of the lode lines on which the above old workings are situated, and as showing lode outcrops of considerable promise on which in some cases old exploratory work is traceable, and lead ore has been found. In connection with these remaining properties a close surface examination is now in progress from two prospecting camps. The object of this preliminary work is the locating of various lode lines, and of promising points for deeper exploration, which will require winding and pumping plant.

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NEW STRIKE.

Very encouraging results have already been obtained on a previously untouched stretch of lode on one of the Dwarsfontein holdings, and the latest news from this property is most encouraging. Trenching has proved the lode along 800 feet of the strike; and two winzes being sunk 500 feet apart continue in the lode at the depth attained, and give promise of developing a large body of good ore. Apart from the ore bodies already worked, this points to the existence of a new rich mine on Dwarsfontein, the potentialities of which have yet to be measured.

SOME GENERAL CONSIDERATIONS.

The general considerations governing the revival of this important industry are full of interest. It may be recalled that considerable work was done on these mines from 1889 to 1895, since when they have remained flooded. The reasons for the closing down of these properties in or before 1895 were, first, the severe fall in the market values of the metals in 1894-95, when lead is recorded as being as low as £9 8s. per ton and silver at 2s. 4d. per oz.; second, the excessive costs then prevailing, especially as regards transport, the nearest coastal railway connection than being in Natal; and third, the difficulty at that time of dealing with the heavy inflows of water which have to be coped with at shallow depths. The ruling conditions of to-day entirely alter the position. With metal values over 150 per cent. higher than the average values realised from 1891 to 1895, with greatly improved transport facilities, and the possibility of much higher and cheaper concentration by more modern processes, the operation of these deposits is placed on a very different footing to that ruling 25 or more years ago. With the available information as to the inflows of water which have to be handled this difficulty becomes an easily solved engineering problem.

LEAD AND SILVER PRICES.

Lead is to-day quoted round about £34 per ton. The present high level of the market price of silver, now quoted at about 5s. 8d. per standard oz. is also likely to continue.

LOCAL SMELTING OF ORE AND CONCENTRATES.

It may be advisable at first to ship the concentrates to Europe for realisation, but later it should be practicable to deal with them at a central smelting and desilvering works adjoining the railway. This would produce fine silver for minting and export and soft lead from which the various requirements of the Union may in time be turned out locally. It will thus be seen that under the greatly more favourable conditions of to-day the re-opening and extension of the old mines becomes a most attractive mining venture, especially as ore which was quite below pay grade in 1895 will now yield a handsome profit. The exploration of the various lode extensions and outcrops promises to add many points of attack to those already partly developed in the past.

The prospects of the venture may, indeed, be described as excellent. Need we say that in view of the value and importance of the industry to the country as a whole, we wish the enterprise of the General Mining people every success, and congratulate them upon the opportune and favourable moment chosen for its inauguration?

Important New Developments.

We understand that Messrs. Clayton & Shuttleworth, Ltd., have recently secured a very important order for Pullman cars, which will be constructed in their rolling stock department, at Abbey Works, Lincoln. It has been generally known for some considerable time that this firm has been steadily pursuing a definite policy with regard to rolling stock, and we think they are to be congratulated on having secured so important a contract in face of keen competition. The Abbey Works, which are equipped in the most up-to-date manner, were only built about two years ago, and it is at these works that the company intend to develop, on a very large scale, the manufacture of railway wagons and carriages. This will mean employment for a very large number of workpeople, and will also mark an important new epoch in the industries hitherto carried on at Lincoln. It is sincerely to be hoped that the local and other authorities realise the importance of assisting, to the greatest extent, new ventures of this type, by providing the necessary housing accommodation for the large influx of workers who are bound to be brought into the district in this connection. In addition to this order for Pullmans, we understand that the firm have on hand several other very important contracts for rolling stock with the Indian State Railways, and certain British railway companies. The company are still continuing the manufacture, on a large scale, at their titanic works, of the well-known "Clayton" steam wagon and oil engines, whilst the Stamp End Works, where the head offices of the company are situate, are given over entirely to the manufacture of thrashers, traction engines, road rollers, steam tractors, clover hullers, steel castings, boilers, etc.

S.A. Alkali, Ltd.

Mr. A. V. Lindbergh, the chairman of the S.A. Alkali, writes.—The directors visited the property on the 19th instant, and have to report the following: Exploration work at the Pan continues to give very [illegible] results, pumping having had the effect of improving the specific gravity of the liquid. A steady head tank of [illegible] gallons capacity has been installed at the highest point of the pipe line into which the mine liquor is now being pumped. From this tank the liquor is passed on to the [illegible] plant. This tank also has the effect of eliminating most of the gas content of the liquor, thus improving its condition for treatment. The new continuous refrigerating cone is working very satisfactorily and has fully come up to expectations. The product of this cone leaves nothing to be desired so far as purity and quantity are concerned. An alteration to the internal scrapers is necessary and this work is now in hand. Our consulting engineer, in conjunction with the makers' representatives, has greatly increased the output of the refrigerating machine and this has materially assisted in achieving this result. There are still several improvements to be made in the drying plant in order to ensure maximum efficiency in production and to prevent contamination of the soda. The engineer is attending to these.

Aerial Progress.

The recent rapid advance in the progress of flying in this country as exemplified by the success of the S.A. Aerial Transports, Ltd., has naturally had the effect of causing the Union Government seriously to consider the necessary legislation to deal with the subject. We understand that aerial matters have been definitely assigned by the Government to the Department of Railways and Harbours, and that the Railway Administration has now set itself to the task of preparing the requisite legislative measures for the consideration of the next session of Parliament.

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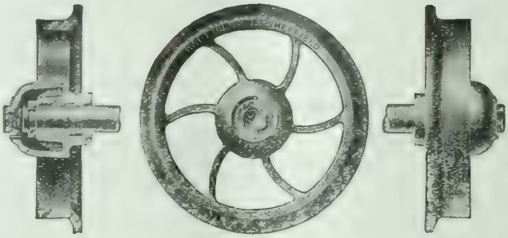

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THE UNION GOVERNMENT AND THE MINING INDUSTRY.

Important Statement by Minister of Mines on Questions of Control and South-West Amalgamation—Result of Recent Conference.

SPEAKING at the banquet of the South African Institution of Engineers, the Hon. F. S. Malan, Minister of Mines, made an important statement in reference to the diamond industry of the country. Regarding the control of supply, he said that a conference of the four groups of producers in the Union, the Government, and representatives from South-West Africa, had unanimously decided that there should be a producers' contract by producers—he meant the four big ones—and it was decided what proportion each of these four should supply to the world's markets, viz., De Beers, 51 per cent.; Premier, 18 per cent.; Jagersfontein, 10 per cent.; and South-West Protectorate, 21 per cent. It was also decided that the amount of the diamonds supplied to the market should be on the basis of the actual sales in the preceding three months. The contract was to be for five years, with a proviso that after twelve months any of the producers might give twelve months' notice, so that in any case the contract was fixed for two years. That arrangement would give stability to the market and enable them to regulate the supply and demand and the price to be maintained in the best interest of everybody concerned. The second question the conference dealt with was how to dispose of the diamonds. It was unanimously decided that it was advisable, if possible, to sell the diamonds of the four big producers through one channel, and thus effectively control the market. It was felt that, provided the London Syndicate which had handled the diamonds for a great number of years was prepared to make satisfactory offers, these should have favourable consideration, and that otherwise steps should be taken by the producers to form a co-operative selling company, and sell the diamonds themselves. The London Syndicate made an offer, and, after prolonged negotiations, it was agreed that it should act as the purchasers of diamonds in South Africa, and not merely as agents for diamond syndicates. In regard to the price, the arrangement was that the Syndicate would pay five per cent. less than the average price obtained during the preceding three months, and any profit made on the actual sale of diamonds over and above the purchase price should be divided between the Syndicate and the producers; this meant, therefore, that every three months the basic price would be fixed, and five per cent. above that price would go to the Syndicate, and after that the proceeds would be equally divided between the producers and the Syndicate. With regard to the sales, the contract was for five years, with a proviso that either party could give notice at the end of the first year, and would then give twelve months' notice. The contract, said Mr. Malan, had the unanimous approval of all the producers, and they had expressed the opinion that it was the best contract they had ever been able to make. Regarding the recent diamond deal in the South-West Protectorate, Mr. Malan said that towards the end of October last the Government received a letter signed by Mr. Oppenheimer, on behalf of the Anglo-American Company, stating that an amalgamation had been arranged between the nine German companies engaged in diamond mining. Secondly, it was stated that it was proposed to register a company under the name of the Consolidated Diamond Mines of South-West Africa, Ltd., with headquarters at Capetown. They asked the Government's consent to such an amalgamation. The reply of the Government was to the effect that they felt the companies should be controlled by a company with headquarters in the Union under our own Parliament. It has been asked why all this had been carried out in secret. It was because, said Mr. Malan, it was carried out between two private parties—Germans on the one hand, and others on the other. The second thing they were asked was whether the Government would recognise the title of these nine companies to the same extent as the Germans themselves had done. The Government had the question before them, and they referred the matter to the Administrator of South-West Africa, and asked him, with the information at his disposal, to report on the companies and their titles as recognised by the German Government. The report of the Administrator was that as far as eight of the companies were concerned there was no reason to doubt the validity of their titles, and the Union Government could thus only recognise their titles. With regard to the remaining concern, the Administrator advised that, although the German company had been previously recognised, the matter should be referred to the Concessions Commission. The Government had intimated to the promoters of the new company that they were prepared to recognise the titles of the eight companies to the same extent as before, but with regard to the ninth they would await the result of the enquiry. The question had also been raised as to whether the Union Government had parted with any of the assets belonging to the Government. The answer was emphatically "No." Questions had been asked as to whether any safeguard had been taken that the diamonds would be worked in South-West Africa. He wished to remind them of the arrangement made at the meeting. At present the sales of South-West African stones amounted to two-and-a-half millions, of which the Government took 60 per cent., after deducting working costs. There was another safeguard: the Syndicate was told that, as a condition precedent to the approval of the Government, they would have to work the mines in South-West Africa to the best advantage of the Union Government and the Protectorate. Another safeguard was that if people invested three-and-a-half millions they would require a return on their money.

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MINISTER OF MINES ON THE COAL INDUSTRY.

Important Speeches at the Annual Reunion of Engineers.

The fourteenth annual dinner of the South African Institution of Engineers, which had been postponed for the period of the War, took place on Saturday night in the Carlton Hotel. Mr. W. Elsdon-Dew presided. Proposing "South Africa," Mr. Leslie (past president of the institution) said that in agriculture this country would prove to have its greatest source of wealth. It was a disgrace that we were not able to feed and clothe ourselves with the products of the country. At present there was no properly organised effort to promote substantial industries and establish "key" industries. The people had to learn to employ the technical backbone of the country. The scheme for a home for technical societies was standing still. After years of struggle they had not a roof, though an institute could be built and equipped for £125,000. He thought it was a disgrace if an industry that got the best brains of technical men could not support a scheme to further not only the interests of South Africa but its own interests.

Mr. Whitehouse (vice-president) proposed "Mines and Industries." He expressed the hope that the recommendations of the Low-Grade Mines Commission would help those mines that were struggling against adverse circumstances. He congratulated the leaders of the mining industry on the excellent feeling which existed between employers and employed. In an industrial survey he showed the tremendous advance that had been made in the export trade, and he predicted that if patience and toleration were exercised while we accommodated ourselves to new conditions a great future lay before this country.

A Word to Coal Owners.

Mr. Malan, the Minister of Mines, in responding to the toast, said he thought his hearers would agree with him that the mining industry had revived during the last few months. They were still hampered from British firms not taking to their base metals, but the latest reports received from a representative the Government had sent to London to arouse interest pointed to considerable success in his labours oversea. In South Africa base minerals had attracted more attention during the last few years than they ever had before. The iron industry was in course of development in three different parts of the Union. It had been shown that there was excellent coke in some of our coal. We were still using primitive methods of producing coal. There had been too much waste; people had worked the best-paying seams and had left the other seams to fall in and become a permanent loss to the community. He trusted that those interested in our coalfields would see that it was to the advantage of the country to utilise all the coal available. He thought it was largely due to the capacity and devotion of technical men that we had come successfully through the crisis, and he hoped that the same ability would be at the disposal of the Government when they came to the erection of a gold refinery. Of the Low-Grade Mines Commission interim report, he remarked that when normal financial conditions were restored the high price of gold would probably come down, and he thought it would be unwise to neglect the other recommended reforms. On the Commission's recommendations that 5,000 natives should be brought from north of latitude 22 as an experiment, he showed that the Government could not give effect to it without a further reference to Parliament. There had been satisfactory progress with the opening of new properties on the Far East Rand. The Government had been successful in placing several tenders for new properties and they looked forward to the new mines taking the place of any of the lame ducks that might be falling out. Mr. Malan's remarks on diamond questions are given elsewhere in this issue.

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Sir Evelyn Wallers, K.B.E., speaking to the toast of the South African Institution of Engineers, remarked that if the Government had listened to the Transvaal Chamber of Mines they need not have formed a Low-Grade Mines Commission. He showed the importance of the engineering profession in the doctrine of increased production.

Mr. Elsdon-Dew responded as the president of the premier technical institution of South Africa. He said that during the War the engineering profession had been called upon to do much, and that what had been accomplished in engineering was so stupendous that we should have to adapt ourselves to many new methods and new devices.

Mr. Kirkland (vice-president) proposed "Our Guests," and Major Stallard, D.S.O., K.C., Col. Calder (past president), and Mr. Blane (member) acknowledged the toast.

Trade with Germany!

The question of trade with Germany is being hotly debated both in South Africa and in England. The *Cape Times* says: "It is not much use appealing to the sentiment of importing merchants or the consuming public to avoid commodities of German origin because of the abominations committed by the German forces and applauded by the German nation during the war. In the not very long run the average merchant and the average consumer will buy German goods if they find that, even after the Government has given preference to British goods, and prevented the dumping of the German article, the former are not forthcoming. The real remedy lies with the British producer, and particularly with the British working man. Even if it were just or sane or practicable to boycott German trade, British trade would profit little unless British goods at a reasonable price were available for export. The only result would be that the orders from the Union to the United States and Japan would go to these countries even more rapidly than has actually been the case. There are many 'lines,' particularly in the engineering trades, in which British manufacturers simply decline to quote a firm price. They cannot tell from one week to another whether the wages of their own employees, or of the employees engaged in producing something indispensable to their production—coal, for instance—may not be increased. Consequently they cannot make a firm contract at a stated price. The result is that orders are going elsewhere, and if this sort of thing continues the German agent will unquestionably find his opportunity. One of the 'lines' particularised in the circular we have before us is glassware. Well, before the war this trade was almost a monopoly of Germany and Austria. Within the last three years, however, factories were established in England, and there seemed every prospect of supplying not only the British home market but the markets of the Dominions with a good article. The success of the whole enterprise has now been imperilled by a senseless and most ill-timed strike. The rest of the Empire cannot wait for the execution of urgent orders until Mr. Smillie and other Labour leaders of the predatory Socio-Syndicalist type obtain all they want. And it is on their shoulders the burden of blame will rest if the German agent again contrives to obtain a firm foothold in the markets of South Africa and the other Dominions. The vast majority of the people of South Africa would rather have goods of British origin: but if British goods are not offered, or are not promptly delivered, or are, by comparison, unreasonably dear, then the trade must inevitably tend to drift to other countries."

THE WEEK IN THE SHAREMARKET.

Gold Stocks Higher & Active on London Buying—Diamonds Booming, Tins Improving.

Business improved daily during the week, and by Thursday had reached high water mark with a large turnover at generally higher quotations. Gold stocks have come back into favour, and Thursday saw heavy buying for London account. The near approach of the dividend season coupled with the increasing prices being obtained for the product is doubtless the direct cause of the greater demand from oversea. The excellent showing at the "Johnnies" meeting also had a good effect, and the cabled report of the chairman's speech undoubtedly created confidence on the other side. Diamond shares are likewise in great demand, and by competent authorities are said to be undervalued in view of the prices being obtained for the stones. Tins, notably Leeuwpoorts and Zaaiplaats, have enjoyed brisk markets, and African Oils have been active at improving quotations. Coal shares are quietly firm. The outlook for a good all-round market seems assured, and everything points to a busy end to the year, with 1920 opening under the best of auspices.

	Fri. 21st.	Sat. 22nd.	Mon. 24th.	Tues. 25th.	Wed. 26th.	Thurs. 27th.
African Farms	16 9	16 0	15 9	15 6*	16 0	16 9
Anglo-Am. Corp.	56 6	57 3	60 6	58 6*	59 6	63 0
Apex Mines	8 0	8 0†	8 0†	7 11†	7 9*	7 6*
Bantjes Cons.	3 1*	3 1*	3 1*	3 2	3 3	3 3*
Blaauwbosch Dmnds.	—	90 0†		-	-	90 0†
Brakpan Mines	65 6*	65 6*	66 0*	69 0†	69 0	70 0
Breyten Collieries	9 0*	9 0*	—	—	—	9 8*
Brick and Potteries	—	4 6*			–	4 6
Bushveld Tins	2 8*	2 9	2 8*	2 9	2 7	2 6
Cinderella Cons.	6 0*	6 0*	6 0*	6 0*	6 0*	6 0
City and Suburbans	8 0	8 0*	8 6	8 0	8 3*	8 3*
City Deeps	—	-	57 6*	60 0	63 0	65 0
Clydesdale Collieries	29 0*	29 0*	29 0*	29 0*		29 0*
Con. Investments	—		-	--	32 0†	32 6
Con. Langlaagtes	—	—	—		24 0†	22 0
Con. Main Reefs	11 6	11 6	11 6*	11 9	12 10½	13 0*
Con. Mines Selection	31 0	31 0	30 0*	30 0	31 0	32 0
Coronation Freeholds.	2 7	2 7*	2 7*	2 7*	2 8	2 7*
Coronation Syndicates	—	11 6	-		—	13 0*
Crown Diamonds	10 6	12 0	12 0	12 6	12 9	13 6
Crown Mines	62 0*	63 0*	64 0*	65 0*	67 6*	67 6*
Daggafontein Mines	22 6	21 6*	21 6	22 6	22 0	22 0
Do. Options	4 0†	3 9†	3 3*	3 6	4 0	3 6*
East Rand Coals	3 0†	3 6†	2 9	2 9	2 9	2 9
East Rand Deeps	1 1*	1 0*	1 1	1 1*	1 1	1 0*
East Rand Props	9 3	9 3*	9 3	9 6*	9 6*	9 11
East Rand Debents.	—	--			£67½*	---
Eastern Golds	2 0†	2 0†	2 0†	1 10†	1 9†	2 0†
Ferreira Deeps	—	—	9 0†	8 0*	8 0*	9 0
Frank Smith Dmds.	9 1	8 10	8 8	8 8	8 3	8 4½
Geduld Props.	57 0	57 9	59 0	58 9	61 6	62 0
Ginsbergs	—	—	—	2 9†	—	—
Glencairns	1 0*	1 0*	–	1 0*	1 0*	1 0*
Glencoe Collieries	—	6 6†	5 6*	5 6*	--	5 0*
Glynn's Lydenburgs.	—	16 6†	15 0*	16 0*	16 0*	16 6*
Govt. Areas	—	98 6	98 9	98 6*	99 6	100 0
Jupiters	4 6*	4 6*	4 9	4 9	4 9	5 0*
Klerksdorp Props	2 0*	2 1*	-	2 0*	2 0*	2 0*
Knight Centrals	6 4*	6 5*	6 6	6 5*	6 6	6 6*
Knights Deeps	6 0*	6 0*	7 6	8 3*	8 3*	8 6
Lace Props	21 9	21 6	21 6*	21 6*	21 9*	21 9
Leeuwpoort Tins	30 9	30 9	31 0	30 9	31 3	31 9
Luipaardsvlei Est	-			4 0†	4 3*	
Lydenburg Farms	8 10	8 10	8 8*	8 8*	9 1	9 3
Meyer and Charltons.	90 0*	92 6*	90 0*		93 0*	92 6
Middelvlei Est	2 6†	2 4*	2 3*	2 6†		2 1
Modder B.'s	178 6*	179 0*	180 0	181 0	185 0	187 6
Modder Deeps	51 0a	52 3b	52 0	52 9	52 6	53 0
Modder Easts	31 0	31 6	32 3	32 4½	32 6	32 3
Do. Opts. (3 yrs.)	12 6*	12 9	13 3	13 0*	13 3	13 0
Do Opts (4 yrs.)	14 7½	14 9	15 0*	—	15 3	15 0
Hume Pipes	21 3*	22 0*	22 6*	23 0	22 6*	22 6*
Natal Navig. Colls	-	28 0*		27 0*		27 0*
National Banks	307 0†				300 0b	300 0†
New Boksburgs	—	—	1 11*	2 0†	—	1 10
New Eland Diamonds	82 6*	80 0	[illegible]	91 6	90 0a	88 6*
New Era Cons.	12 6	12 6	12 0	12 0*	12 1*	12 3
New Geduld Deeps	2 0	2 0*	2 0*	2 0*	2 3	2 3
New Heriots	10 0†	8 6*	[illegible]	9 6*	9 0*	9 9
New Kleinfonteins	11 9	11 6	[illegible]	12 6	12 9	12 9
New Modders	-	£30¾	£31	[illegible]	[illegible]	£32½
New State Areas	31 6	31 [illegible]	[illegible] 9	32 6	32 3*	32 9
New Stock 4½ p. c.	£102*	£102*	£102*	£102*	£102*	£102*
Do. 5 per cent	£101⅛	£101*	£101⅞	£101⅛	£101†	£101
New Uniteds	5 0*	5 0*	5 0*	5 0*	5 0*	5 9†
Nigels	7 0*	7 3*	7 9*	7 0*	7 0*	7 0*
Nourse Mines	12 6*	12 6*	13 0*	15 0†	14 0*	14 0
Pretoria Cements	96 6*	98 0†	98 0†	95 6	96 0	97 6
Princess Estates	2 9*	2 11	3 0	3 0*	3 0*	3 3
Rand Collieries	3 6*	3 6*	3 6*	3 6*	3 6*	3 6*
Rand Nucleus	2 0*	2 1*	2 0*	2 1*	—	2 0*
Rand Select. Corp.	96 0a	98 0	100 0	100 0	104 3	110 0
Randfontein Deeps	6 3*	6 0*	6 2*	6 3*	6 9*	6 9*
Randfontein Est.	24 0b	24 0	24 9	24 9	24 6	25 7½
Roberts Victors	16 0	19 0	20 0	19 9	19 6	20 0
Roonbergs	8 0	8 3†	8 0	8 3	8 3	8 3
Roodepoort Uniteds	—	4 0*	3 9*	3 9*		3 9
Rouxvilles	29 0	29 3	29 0	28 0	27 6	26 6
Ryan Nigels	—	3 9*	4 6*	4 0*		3 9*
Shebas	1 6*		1 9		2 3	2 0
Simmer Deeps	2 6†	2 6†	2 6†	2 6†	2 9	2 6
S.A. Breweries	40 0*	40 0*	40 0*	40 0*	41 0	40 0*
S.A. Lands	6 8	6 6*	6 7	6 6*	6 7	6 8
South Van Ryns	8 3	8 6	8 6*	8 7½	8 9	8 9
Springs Mines	54 3	54 6	—	—	54 0	—
Sub-Nigels	20 9	20 6*	20 9*	20 6	20 6	20 6*
Swaziland Tins	—	18 0†	18 0†	18 0†	18 0†	14 0*
Transvaal Lands	—	—	—	—		30 0†
Trans. G.M. Est.	16 0†	16 0†	14 6*	—	-	16 6†
Tweefontein Colls.	26 0*	26 0*	26 0*	26 0*	26 0*	26 0*
Union 5 per cent.	£103¾	£103*	£103	£103	£103*	£103
Van Dyks	3 0*	3 6	3 6	—	3 8†	3 4*
Van Ryn Deeps	89 0	90 6*	91 6*	91 9	93 0	—
Victory Monarch	39 6	39 6	40 0a	40 6	40 0	—
Village Deeps	14 6†	14 6†	14 0*	14 0*	14 0*	14 0*
Village Main Reefs	8 6†		6 6*		-	6 6*
West Springs	27 0	26 9	27 0	27 3	27 0	27 0
Do. Options	10 3	10 3	10 3	10 3	10 0	10 0*
Western Rand Est.	11 0*	10 9	10 6	9 9	10 0	—
Witwatersrands		-	—	—	17 6*	20 0†
Wit. Deeps	9 0*	9 0*	-	—	10 0†	9 0*
Wolhuters	3 3	3 3*	3 4*	3 3*	3 4*	3 9
Zaaiplaats Tins	11 3b	—	11—1	11 6	11 11	11 11

*Buyers. †Sellers. aOdd lots. bEx London.

Why Hadfield's Never Had a Strike.

Sir Robert Hadfield employs 15,000 workers in his great steel works at Sheffield, and in twenty-five years of experience as a managing director he claims that he has never had a strike. To *System*, for August, he contributes the results of his personal experience in maintaining unbroken friendly relations with his workers, insisting that *co-operation*, not conciliation, must be the aim of every employer who knows his business and has the interests of the community at heart. "We moved a river out of its bed and made a new one for it in order to enlarge the area of our works at Sheffield for the ever-increasing demands of War. Merely moving that river would have been an achievement of itself a few years ago; we did it as an incident to making munitions. We can do as much as that for the work of peace. . . . To-day, the relations between capital and labour are chaotic, the employer seems to be far away (speaking generally and not specifically) from his employee, and more or less the same condition holds in other countries, but the gap is not as wide as appears on first impression. The most radical—and not the average—worker speaks for the employee, and the most backward or 'conservative'—and not the average—owner talks for the employers. Neither is representative of his class; the average worker does not wish to destroy the place in which he works, and the average employer does not wish to get the last drop of blood out of his employee. It will be well to bear in mind that a reasonable adjustment will most certainly not satisfy the extremists of either class." Sir Robert is a firm believer in the economy of working short hours and of paying high wages, but he recognises that there is a definite limit to the speeding up of labour during shorter working hours, and that there must be *no excessive pressure upon the human unit*. Men are not machines, and overwork in shorter hours is as disastrous as the strain of working long hours per day.

A REVIEW OF THE SOUTH AFRICAN MINING AND ENGINEERING TRADE.—II.

What Happened in the War Period—Possibilities of the Market for British Goods—American Competition.

Windmills.—For some time past American windmills have secured a strong hold in this market, and there is only one British manufacturer who has made any real attempt to compete for this trade. On the other hand, American windmills are supplied by several American manufacturers. The product of the United Kingdom has much to recommend it, so far as durability is concerned, but when the question of price, which is of paramount importance in this market, is considered, the American article has an immense advantage. A close study of the conditions of this market is of the highest importance, and it is essential that United Kingdom manufacturers should take every opportunity of making known the merits of their own windmill, not only in the leading towns but throughout the length and breadth of South Africa, and so see how far it is possible for them to reduce costs to compete with American productions.

Manufacturing Machinery.—Having regard to the rapid strides which have been made in local industries, and the enormous contemplated industrial development in South Africa, there is every reason to believe that the future demand from the United Kingdom for manufacturing machinery of all descriptions will be very great.

Refrigerating Machinery.—During recent years, and more especially during the War, when the demand for South African produce increased both in South Africa and elsewhere, the tax upon the then existing plant for refrigerating purposes far exceeded expectations, and with the greater ability of South Africa to supply other countries with foodstuffs of every description, including frozen meat, fruit, butter, etc., a demand for additional refrigerating machinery will be made. Even at the present time, the existing plant is totally inadequate to deal with the volume of traffic which passes through the cold storage. The possibilities of South Africa as an exporting country for produce is becoming increasingly manifest and cold storage schemes by several Municipalities have been suspended during the War solely as a consequence of the shortage of material for constructional purposes and of shipping space for the importation of the various commodities required in connection therewith. Manufacturers of this class of machinery will be well advised to take the earliest opportunity of studying the requirements of this market and of endeavouring to ascertain the extent of the probable future demand. The requirements of the railways must also be taken into consideration and, as the advantages of refrigerating machinery become more generally recognised, the smaller towns will no doubt take steps to provide cold storage accommodation.

Mining Machinery.—The combined efforts of the local manufactories which have sprung into prominence or into existence since the commencement of the War have demonstrated the ability of South African manufacturers to meet the requirements of the mines in a way sufficient, at least, to maintain their operations to the extent of about 80 per cent. to 90 per cent. of their pre-War capacity. But the manufacture of special machinery, such as turbines, steam engines of all kinds, steam hoists, pumps, etc., will in all probability be beyond the reach of the local manufacturing community for a considerable number of years. In point of value the imports into South Africa in 1913 were £765,986, of which the United Kingdom supplied goods to the value of £511,968 and the United States of America to the value of £161,191. German goods were valued at £73,939 and Danish goods at £11,273. In 1918, the total imports were valued at £569,448 and the imports from the United Kingdom were valued at £292,123, from which it will be seen that the United Kingdom supplies were far lower in proportion to the total in 1918 than in 1913. On the other hand, the imports of American machinery in 1918 were valued at £271,730 and, consequently, the proportion of America's contribution to the total imports in 1918 has increased as compared with her proportion to the total in 1913. It must, however, be borne in mind that during the War the facilities to obtain machinery from the United States of America were considerably greater than in the case of the United Kingdom. The demand for all classes of mining machinery is very great and it is only by local supplies and by the ingenuity which has been shown by mining engineers in repairing and reconstructing machinery that the inability to obtain an adequate supply of machinery from overseas has not been attended with disastrous results. So far as Rhodesia is concerned, very little new machinery has been indented, for the mining industry of the country has fallen back on second-hand boilers, engines, crushers, batteries, winding engines and pumps, of which there has been

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a large supply owing to the fact that many mines have become worked out and the plant sold. While several small mines have commenced operations, practically no large ones have commenced crushing, chiefly because no new capital has been obtained from the United Kingdom. It appears, therefore, that, so far as Rhodesia is concerned, new machinery has not been diverted to countries other than the United Kingdom, but that orders have been suspended until they can be executed by United Kingdom manufacturers.

Pumps.—The importance of pumps of various descriptions has decreased during the War, and the demand, particularly for pumps used in connection with the mines, is very great. In this connection, it is well to call attention to the advisability of introducing a British manufactured high lift centrifugal pump for heads up to 2,000 to 3,000 feet. The bulk of this business is in the hands of foreign manufacturers, notably a large firm of manufacturers in Switzerland. It will be a matter of some difficulty to introduce British competition in this direction, because the pumps supplied by foreign manufacturers have, in most instances, given complete satisfaction. It not infrequently happens that the supply of an important branch of machinery encourages a demand for supplies of other manufactures from the same source. For example, there are many mines in which not only pumps of foreign manufacture have been installed, but also pump-motors and pipe columns.

Wire Rope.—In 1913 the total imports of wire rope were 75,812 cwts. of which no less than 75,551 cwts. were imported from the United Kingdom. In 1918 the total imports amounted to 31,164 cwts., of which the United Kingdom contributed 28,794 cwts. It will thus be seen that, although the quantity imported in 1918 was less than half the quantity imported during the year immediately preceding the War, the position of the United Kingdom as an exporter to this market has been well maintained. The increase in the importations from the United States is distinctive. In 1913 only 72 cwts. of goods of American manufacture were imported, whilst in 1918 American supplies were represented by 1,193 cwts. In 1913 the average value per cwt. was approximately £1 10s., but in 1918 the average value per cwt. was £3, or an increase of about 100 per cent. in value. There is a great scarcity of wire rope, and the demand from the United Kingdom will be very great. In 1917 Canada commenced to send supplies to this market, but the quantity imported was very small. So far as this trade is concerned, the pre-War demand for the British article is likely to be exceeded in the near future.

(To be continued.)

The report of New Rhodesia Mines, Ltd., for the year ended 31st May last states that the Rhodesian properties owned by the company consist of 45 mining claims, one half interest in the Kameel Mine (50 claims), a farm of 6,000 acres, and a half interest in a coal area situated 100 miles north-west of the Eldorado railway terminus. The Howard Mine has been let on a tribute agreement, the royalty payable for the first six months from 1st June last being at the rate of 2½ per cent., with option for a further two years on a sliding scale royalty. 338,400 shares of the Thompson Krist Mining Company have now been received in exchange for the 112,800 shares of the Porcupine Krist Company. The work on the North Thompson, and consequently the work on the Porcupine Krist Mine, has been shut down for a considerable period owing to the shortage and increasing cost of labour and materials, the cost of mining operations being so high that it is undoubtedly the better policy to postpone further operations for the time being. The accounts show a loss for the year of £3,613, increasing the debit balance brought down to £39.118.

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Native Labour.

The following is a statement of native labourers employed on mines and works and natives in other employ in the proclaimed labour districts of the Transvaal on September 30, 1919:—

	Mines and Works.	Other Employ.	Total.
Johannesburg	57,052	53,088	110,140
Krugersdorp	4,722	2,154	6,876
Roodepoort	13,634	1,725	15,359
Randfontein	15,039	774	15.813
Boksburg	14,297	3,047	17,344
Benoni	33,092	4,178	37,270
Germiston	29.993	5,391	35,384
Springs	12,193	2,236	14,429
Heidelberg	2.000	728	2.728
Klerksdorp	—	1.126	1,126
Vereeniging	992	599	1,591
Rayton	6,094	973	7.067
Witbank	10.852	971	11.823
Rooiberg	464	42	506
Grand total	200.424	77,032	277,456

Jumbo Gold Mine.

The report of the Jumbo Gold Mining Company for the year ended 30th June, 1919, states that milling and cyanide retreatment were stopped in March, 1917. The total number of tons crushed by the company since crushing commenced in May, 1906, to 31st March, 1917, is 32,837, the value of gold won being £626,779. The tributors continued work during the year, and gold to the value of £5,222 was won, the royalty on which, payable to the company, amounted to £402. Owing to excessive cost of plant and material and the heavy outlay required for erection the re-opening and equipping of the Tip Top mine has not been taken in hand. The question, however, is now being thoroughly considered. The vacancy created by the death of Mr. George Lewis has been filled by the appointment of Mr. Charles Hilliard.

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TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Consolidated Investments' Excellent Report—The Building Boom—Iron and Steel—Electrical Goods—Explosives : Rise in Nitrate of Lead—Oils, Colours and Grease..

The optimistic feeling noticed last week is still in the ascendant. One particular reason is that the American Exchange has dropped to 16s. 6d. as representing the British paper pound. This has brought a few speculators into the market, or rather that merchants with ample funds are purchasing from one another imported iron, steel plates and all kinds of mining material and paint ingredients. For example, there was an order in the market on Wednesday for 100 tons of Canadian iron at 27s. 6d. per 100 lbs. The order was not placed, but there is nothing unusual about the price, seeing that not long ago a big consignment was offered at 26s. This speculative element is on account, as previously remarked, of the heavy exchange between here and America and also owing to the difficulty of obtaining things from Great Britain. Upon inquiring of an American importing house, it was understood that very little business is being transacted, as all orders have to be confirmed in New York, and even in respect of the few confirmed no guarantee is given as to when they can be delivered. As regards Great Britain, a partner in an iron and steel house cabled only this week stating that it was impossible to buy there, as Johannesburg quotations were lower than the British, therefore his partner had to purchase wherever he could to replace stocks locally. The position is far from the acute stage, as considerable essential stocks are on hand and the mines are buying only sufficient to carry them on from month to month. According to a hint received from a buying department it seems that quantities of mining materials and stores are being transferred from one mine to another, so that the different groups can average stocks down as compared with the heavy commitments during the War period. Notwithstanding the poorness of the mines' orders there is a good feeling on the Commercial Exchange, as it is recognised that the price of gold and the extraordinary economy being exercised by the mines will keep the poorer-grade mines going for the time being. The chief complaint is the shortage of natives, and relief is expected through the Lower-Grade Mines Commission.

THE BUILDING BOOM.

A builders' broker states that he is hardly earning anything, for although he is inundated with orders for bricks, tiles, roofing iron and so forth, he can scarcely do any business in consequence of the shortage of all kinds of building materials. Deals, 10 feet, are 1s. 7d. to 1s. 8d.; up to 17 feet, 1s. 9½d.; 18 and 19 feet, 1s. 10d.; and 20 feet, 1s. 10½d. Floorings, 9d. to 9¼d. Ceilings, 6⅛d. to 6¾d. These prices include the extra railway charges. Roofing iron is 1s. 5d., 1s. 6d., 1s. 7d. per foot according to length. As regards baths, sanitary ware and builders' hardware there are very fair stocks in town, but prices have gradually advanced. Chiefly when the new goods arrive and the landed cost increased, then a general fractional rise is added to all stocks affected. Business is excellent and more could be done if the materials were available.

SECOND-HAND IRON AND TIMBER.

Stocks of second-hand iron and timber are still very scarce, but fresh supplies are expected here shortly. Second-hand timber, when procurable, is about 1s. 7d., the same price is also ruling for second-hand iron. This quotation, however, is merely a nominal one, as there are practically no stocks in town. Orders are fairly plentiful in the second-hand yards, but can perforce be only partly executed under the circumstances.

IRON AND STEEL.

Prices for imported iron are gradually rising, as the large sizes of imported bar iron are 35s., and the smaller 37s. 6d. to 42s. 6d., flats. Small rounds, 38s. to 44s., and the large 45s. per 100lbs. Small round mild steel bars are getting scarcer every day, and the prices range from 38s. to 52s. 6d. Steel plates are none too plentiful, and some sizes are exhausted. The price is for 42s. 6d. to 60s. per 100lbs., according to the thickness. Steel shafting is also scarce, especially small sizes. There are fewer inquiries from Johannesburg and the country, but orders when placed are greater in bulk. Brass and copper sheets and rods are on the up grade, as a few weeks ago they were not easy to sell

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at 2s. 3d., but now a 2s. 6d. as a rule can readily be obtained. Heavy lines are not arriving at all well from Britain, and America of late has been disappointing to her supporters. Shovels are 60s. to 65s. a dozen. Wheelbarrows about 50s. each. Wire nails are advancing, especially those up to 3 inches; over 3 inches there is a fair supply. One inch, 65s.; 1½, 55s.; 2 and 3, 45s.; 4in., 40s.; 5in. 37s. 6d.; and 6in., 35s. American bolts, which are not in such extensive demand, are now more expensive than the English. Small size piping up to 2in. is now very scarce indeed. Loco type boilers, also multi-tubular boilers, are exceptionally scarce. This is not surprising, seeing we have been constantly sending these boilers weekly to all parts of the Union, the Belgian Congo, and Rhodesia, but of late the replenishment has been very meagre. There have been inquiries for water ballast rollers; these are very difficult to obtain. It was noticed at one of the yards that a number of large valves were stored. These are one of the few things which have not advanced in price throughout the War, and the owner cannot understand why there is such a small demand for them.

Electrical Goods.

Tubing, of which we reported a scarcity in our last issue, is now coming in fairly freely, but it is not expected that the present stocks and those shortly to arrive, will last longer than the end of next April. Nor are the prospects of considerable consignments of this article very bright in view of the difficulties being experienced at Home in procuring the raw materials. Wiring is also not expected to last longer than the end of the present month, and will consequently soon increase in price. Lamps are much about the same with a tendency to go higher, together with practically all electrical mining material. Ceiling roses are still unprocurable. Town and country business remains very good. The bugbear of the electrical material market (as with others) is of course the raw material difficulty in Europe, which it is expected will continue for some considerable time, as it is impossible for manufacturers in the old country to obtain the same in workable quantities, and this, with the all-world labour unrest, is preventing the industry from resuming anything like normal activity.

Explosives—Rise in Nitrate of Lead.

Owing to the rise in nitrate of lead all over the world the British South African Explosives Co., Ltd., have been compelled to raise the price of this commodity by £2 a ton, making it £57 10s. 0d., less 5% per ton of 2,000lbs. delivered to the mines on the Witwatersrand. The tendency of pig lead is distinctly upward, the demand for home consumption is larger, and supplies are falling steadily, although the British Government's stocks are still about 50,000 tons, deducting estimated sales of metal yet undelivered. Stocks in the United States of America have been reduced to quite small proportions, and the output is so reduced and handicapped by high costs that prices are sure to rise materially in the near future. It is impossible to import American lead at present, as the American price is far above London. The British Government have now an excellent opportunity to get rid of their surplus in the absence of any important competition. Spain is very reserved, and new output is also less. Operations in Australia are still hindered by labour complications and higher wages, but there is a good surplus lying there, which is held up more or less in consequence of the dearth of freight. From this it is apparent that it will be some considerable time before lower costs can come into operation in South Africa in respect of explosives. The B.S.A. Co. further state that there has been a shortage of suitable fuse lighters, but supplies of materials have now arrived at the factory, and in about a week's time they expect to be in a position to execute orders promptly. The reason of the shortage was the bringing into force by the Mines Department of new regulations, making the percentage of obnoxious fumes very low—quite 5%—which had the effect of cutting out the supplies which were then available.

Oils, Colours and Grease.

Business is brisk on account of the demand from the building and painting trades. All paint ingredients are quietly advancing. Linseed oil, raw, 100s. to 105s.; boiled, 110s. to 115s. per case of 2-4's. Turps, 110s. 2-4's; and 120s. 10-1's. White lead, 90s. per 100 lbs. and 1s. per lb. for smaller quantities. Castor oil, best, 115s. to 120s.; seconds, 100s. per case of two-fours. Olive oil, 35s. per gallon. All plate and window glass is scarce, and there seems no reasonable chance of obtaining any from St. Helens for several months to come. Hopes are entertained that we might obtain occasional supplies from America.

Several enterprising firms are manufacturing mining greases locally, and it is pleasing to note that the standard of quality is fairly well up to the imported article, and the price is about 33⅓% below the latter. The fact that fully 90% of the gold, coal and diamond mines throughout the Union are to-day using locally manufactured anti-friction grease speaks very highly for the quality, and ought to induce the minority, who still remain conservative, to encourage local industry by giving it their whole-hearted support.

The price of imported grease still remains at £45 per ton, while a local grease of excellent quality can be bought at £27 to £30 per ton, and would even be cheaper were it not for a recent increase in the cost of ingredients, together with an extra 15% advance on the railage rates.

Consolidated Investment Report.

The annual reports of this and other groups have become historical and portray faithfully the course of the mining and property markets. They are naturally prepared by experts for a very critical public both here and overseas. This balance-sheet is the best ever presented by that company, but what patience and tenacity must have been exercised by the board, since the late Hon. John Tudhope first entered its service? Whilst this is the case, there is undoubtedly an outstanding feature to account for the present marvellous prosperity. The turning point came when the company secured the Government Areas proposition on the

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Far Eastern Rand. The Chairman said that, speaking generally, the prospects of the State Mine were never so bright as at present, because at the end of October the reserves were over ten million tons, and an improvement in quantity as well as quality was expected at the end of this year. There has been a slight falling off in the percentage of payability, but this is more than counterbalanced by the very high values of the reef exposed. The New State Areas and Van Ryn Deeps are also well spoken of, also Randfontein Centrals have recently struck a rich reef at 3,210 feet, giving an average value of 9.8dwts. over a width of 48 inches. This may be a good indication that the Robinson management was not in error in erecting one of the largest, if not the largest battery-mill in the world. Well, the company has some wonderfully good gold mines, as well as their interests in the diamond world. The report, however, is not such an open book on diamonds as on the Transvaal gold industry, which no doubt is a question of good policy seeing our Government has control of the whole of the South-Western Protectorate diamond fields. It must be admitted that the diamond industry was of paramount importance to the quick development of these gold fields, as a number of virile people came from Kimberley with money in their pockets, and so took a big share in the building up of our great Johannesburg, which went hand in hand with the progress of the mines. In those early days the name of Barnato was a name to conjure with, and now Mr. Solly Joel, the nephew, has a big say in the South African Diamond industry as well as the buying syndicate in London. In this connection Mr. Imroth, in seconding the adoption of the report, said that he had no doubt the conclusions arrived at by the conference recently held under the ægis of the Government in Pretoria will prove a benefit to all interested in diamonds. He felt confident that so long as the present policy is followed the price of diamonds will be maintained. Another stroke of luck is that the property market has advanced so well and rapidly that it has enabled the company to develop the Houghton Estate and northern suburbs' interests excellently. The directors quickly rose to the occasion by making new roads, as well as other improvements, and built specimen houses and advanced moneys at very reasonable rates. The Chairman promised to bring the subject of a superannuation fund before his co-directors. In a big concern like the one under review the inside staff with its expert and responsible controllers must be well looked after, and a pension is always an attraction and a steadier to one's nerves on dull and worrying days.

South-Western Transvaal Diamond Returns.

The following is the official statement of the diamond output from the public diggings in the month of September:

	Carats.	Value.
January	3 385¾	£31.685 8 6
February	4.631½	41.968 8 6
March	5.431¼	54.166 0 0
April	5 530¾	59.261 7 6
May	5.964¾	68.473 10 9
June	5.116¾	63.863 10 0
July	6.384	86.922 0 0
August	7.182	103.397 0 0
September	7.228	122.791 0 0

The individual producers were as follows: -

BLOEMHOF DISTRICT

	Carats.	Value.
Bloemhof	182½	£2,96[illegible]
Blesbokfontein	1,163	19,165
Bloemheuvel	66	918
Cawoodshope	2	14
Christiana	134¼	2,792
Dievedraai	86½	1,722
Diamantdoorns	6½	73
Eerstebegin	56	1,323
Goudplaats	49½	1,097
Grootpoort	1½	12
Grootdoorns	23¾	726
Goodehoop	17¼	290
Italie	128¾	1 941
Kromellenboog	4¼	132
Kuilfontein	15	26
Koppiesvlei	11	224
Kafferspan	6¾	295
Kameelkuil	1.846	32,608
London	323½	5,785
Mimosa	11¼	190
Middelbosch	¾	7
Mooifontein	62½	1,465
Olievenfontein	4½	57
Outspanning	¼	1
Plessisdam	146¼	2,072
Panfontein	24¼	373
Rietput	13¼	220
Schweizer Reneke	104¼	1.659
Sandringham	30	304
Schoongezicht	4½	112
Vechtvallei	134¼	2,796
Witgatboom	¾	10
Zwartlaagte	30½	897

WOLMARANSSTAD DISTRICT.

Doornbult	34¼	987
Goedgedacht	2½	18
Hollowaysrust	40½	664
Klipkuil	47	707
Katdoornkraal	16¾	277
Kareepan	452½	7,770
Leeuwfontein	154¼	2.293
Rietkuil	1.623¼	25,068
Syferfontein	3	93
Syfergat	82½	1,484

POTCHEFSTROOM DISTRICT.

Eastleigh	80¼	1.165

Cape Diggings Diamond Output.

Statement of the output of diamonds from the public diggings in the Cape Province during the month of October, 1919:—

BARKLY WEST.

Area.	No. of Diggers.	Weight Carats.	Value.
Bad Hope	1	4¼	£88 0 0
Delport's Hope	36	164¾	3,336 2 6
Eland's Drift	1	1	10 0 0
Forlorn Hope	2	3¾	60 10 0
Gong Gong	35	322½	7.263 10 0
Good Hope	105	398¼	6.169 2 0
Harrisdale	33	228¾	5.136 0 0
Hebron	82	348¼	7.283 7 6
Holpan	15	57	770 15 0
Jonas Kopje	3	12¾	462 0 0
Kareepan	64	329½	6,227 12 6
Keiskama	5	14½	189 15 0
Klipdam	66	354¼	6.083 5 0
Klipdrift	31	134	2,033 0 0
Last Hope	6	11	213 0 0
Longlands	42	925¾	22 320 10 0
Niekerk's Rush	6	25	381 0 0
Ricketts' Pros.	8	35¾	629 15 0
Scholtz's Pros.	21	85	1,177 0 0
Snyder's Rush	9	91¾	2,464 5 0
Union Kopje	1	4	190 0 0
Van Zoelen's Laagte	9	32¼	525 10 0
Waldeck's Plant	44	335¼	5.728 15 0
Ward's Hope	7	31	952 0 0
Winter's Rush	39	381	9,253 0 0
	671	4,331¼	£88,947 14 6

N.B.—The number of claimholders in the Barkly West district during October, 1919, was 1.949.

HERBERT DISTRICT.

Brypaal	22	63½	£1.464 0 0
Davisdrift	2	18¼	487 10 0
Mosesberg	162	925¼	18 575 10 0
Platdrift	1	1¾	10 0 0
Schmidt's Drift	58	246	5,004 10 0
Sevonelles	1	3¼	100 0 0
	246	1,258½	£25.641 10 0

KIMBERLEY DISTRICT.

Robinson's Kopje	6	43¾	£1.215 10 0
Wedberg	6	66¼	2.570 0 0
	12	110	£3,785 10 0

TAUNGS DISTRICT.

Home Rule	100	1,709	£29,563 7 6
Killarney	5	53½	661 0 0
	105	1,762½	£30.224 7 6

PRIVATE ESTATES

River View Diamond Syndicate	221½	£5,257 10 0
Pniel Estate	193¼	3,157 5 0
New Vaal River D. & E. Syndicate	1,123	22,334 5 0

Company Meetings.

"J.C.I." ANNUAL MEETING.

The annual meeting of the Johannesburg Consolidated Investment Company held on November 25 attracted a large attendance of shareholders over which Mr. John Munro presided.

Those present included Mr. G. Imroth, Mr. C. Marx, Mr. H. A. Rogers, Mr. J. Emrys Evans, Mr. P. Richardson, Mr. C. Aburrow, Mr. H. Adler, Mr. H. W Anderson, Mr. J. Brown, Mr. J. G. Carter, Mr. L. B. Chesterton, Mr. J Andrew Cohen, Mr. A. C. Collins, Mr. J. H. Crosby, Colonel W. Dalrymple, Mr. P. A. Ettein, Mr. W. Fergusson, Mr. G. C. Fitzpatrick (representing Mr. J. Friedlander), Mr. C. J. Fredrickson, Mr. J. Gimmel, Mr. P. Goodman, Mr. T. J. Grahame, Mr. E. R. Grant, Mr. J. R. Grewer, Mr. C. Grosser, Mr. J. Hardwick, Mr. E. Hind, Mr. E. M. Hind, Mr. F. Hilner, Mr. E. Lewin, Mr. J. Lyttle, Mr. W. Mackenzie, Mr. J. B Mackinlay, Mr. J. H. L. Manisty, Mr. W. Mountstephens, Mr. G. M. Pemberton, Mr. W. Reid, Mr. E. Rohr, Mr. W. Ross, Mr. J. F. Rutherford, Mr. A. Silver, Mr. F. Steed, Mr. V. Southwell, Mr. A. Sutherland, Mr. W. T. Warrener, Mr. W. S. Webber, Mr R. Welsh, Mr. P. E. Welsh, Mr. A. William, Mr. J. Withecombe, Mr. W. L. White, Mr. A. Wridgway and the secretary, Mr. W. H. Mardall.

THE CHAIRMAN'S SPEECH.

The chairman said: Gentlemen, the directors' report and accounts submitted to you to-day are for the financial year ended 30th June, 1919. The same were duly circulated amongst our shareholders on the 10th October, and, I trust, have been found satisfactory. It was a great pleasure to your directors to be able to increase the annual dividend from 5 to 7½ per cent. free of tax, and, when I have informed you as to the financial position and standing of the company, I think you will agree that your directors were fully justified in their action in this direction. I will now proceed to deal with the balance sheet and profit and loss acount:

Liabilities: The issued capital of the company, £3,950,000, remains unchanged; as also the reserve fund of £250,000.

Sundry Creditors. £720,841: The increase of £351,242 under this heading represents increased deposits and current accounts in Johannesburg and London, due to the expansion of the company's business.

Contingent Liabilities. £596.571: Our contingent liabilities at 30th June, 1919, show an increase of £37.379 over last year's figures, due to certain new partly paid shares acquired. Since the close of our financial year the amount of our contingent liabilities has been reduced by a considerable sum. I would beg to draw your attention to the fact that, in the balance sheet now submitted to you, the total amount under this heading only represents about 50 per cent. of our liquid assets. Turning to the assets side of the balance sheet the first item is:—

Stocks and Shares.

Stocks and Shares, £3.525.140: This reflects an increase of £208.082, being the difference between the value of new investments made and of shares realised after allowing for full depreciation on certain of our shareholdings. In accordance with our invariable practice the "book values" of our investments in stocks and shares have been written down to their "market value" as at 30th June, 1918. At that date the market value of our investments under this heading showed a very large appreciation over the amount at which they appear in the balance sheet, and at to-day's prices an even greater appreciation is reflected; but no credit is taken for this in our accounts. It will give you much satisfaction when I tell you that the appreciation on our shareholdings at to-day's market price is not only considerably larger than last year, but indeed constitutes a record in the history of the company.

Mining Properties and Advances to Mining Companies, £54,788: A decrease of £14,650 hereunder is accounted for by the repayment of temporary advances to the mines of our group, less new advances made. In our next annual accounts a considerable increase will be reflected in this item, due to our financing the Randfontein Estates G.M. Co., Ltd., during the period of shaft sinking and development by the Randfontein Central G.M. Co., to which I will refer later on.

Real Estate and Buildings, £508.709: This amount is made up as follows:—

Johannesburg Properties	£280,709	0	0
J'burg Suburban Estates	85,742	0	0
	£366,451	0	0
Other Properties in S.A. ..	37.059	0	0
Property in London	105,199	0	0
Total ..	£508,709	0	0

This total reflects a decrease of £30,000, representing the "book value" of ground sold on our suburban estates, the sale price of certain town properties disposed of during the year, and the amount written off for depreciation of the ground rent capitalisation account. The Municipal Council valuation of our town properties and suburban estates was, at 30th June, 1919, £537,365, reflecting a surplus of £170,914 over the amount at which they appear in our accounts.

The Munro Drive.

It is gratifying to report that recently there has been a great demand for building sites on our estates, and many new residences are in course of erection thereon. The "Munro Drive," connecting the upper with the lower portion of the Houghton Estate, has now been completed and handed over to the Municipality. This road, I think, with all due modesty, I may describe as the most beautiful drive within the Municipal area. It is a great acquisition to the town, and should materially assist us in the development of the lower portion of the Houghton Estate. Our town properties are all well let at fairly remunerative rentals, but our revenue from our suburban estates has been adversely affected by the incidence of the Municipal taxation. Our London property is an extremely valuable one and yields a satisfactory return on the capital employed.

Lourenco Marques Properties.

With a view to consolidating our interests at Lourenco Marques, we have arranged to transfer all our properties to the Delagoa Bay Lands Syndicate, for shares in that company, and this item will now disappear from our accounts. At our last annual meeting I informed shareholders that the Delagoa Bay Lands Syndicate contemplated the erection of a large hotel on the Polana Estate. I am pleased to report that a satisfactory arrangement has been arrived at between the Portuguese authorities and the syndicate. Plans prepared by Messrs. A. and W. Reid and Delbridge have been approved of by both parties, and a contract entered into for the erection of the hotel which is estimated to cost approximately £200,000. A start has been made on the work and the erection will be pushed on as expeditiously as possible.

Carlton Hotel: The improved results from the hotel, I am pleased to say, continue. The hotel well maintains its popularity as the centre of social life on the Rand.

Loans on Mortgage and Real Estate. £105,562: An increase of £19,111 is shown under this heading, representing the surplus of new loans granted plus the unpaid balance of ground sold on the instalment principle, over mortgage bonds paid off. All our loans of this nature are in a sound and healthy condition and amply secured. We are always open to make building loans of a reasonable amount at a moderate rate of interest, to assist purchasers of ground on our estates to erect residences on the property acquired.

Pre-War Loans. £34,662: A further sum of £68,000 was paid off these loans during the financial year, leaving the above small balance to be collected. You will doubtless remember that in 1915 the total was nearly half a million pounds.

Loans at Short Call on Market Securities, £725.317: A very satisfactory increase of £269.374 is here reflected. We are pleased to be able to report the profitable employment of a portion of our funds in this direction.

Sundry Debtors and Dividends Accrued. £387,153: These represent our ordinary current accounts and dividends declared but not paid at 30th June. 1919. An increase of £142.064 is reflected in the account, which is largely due to increased dividends declared by the Van Ryn Deep Company and the Government Areas, in both of which this company holds a very large interest.

The remaining two items do not require special comment.

Financial Position.

The financial position of the company, gentlemen, I can only describe as one of exceptional strength. At the 30th June, 1919, the total book value of your assets (exclusive of the large appreciation in the value of your "Investments in Stocks and Shares" to which I have already alluded) amounted to £5.403.100, reflecting an increase of over £474.00 on our last year's figures. This total value of our assets shows a surplus of £3.789.438 over our total liabilities to the public, including the dividend of 7½ per cent. declared on the 24th June and paid on the 26th September, 1919. and our "Contingent Liabilities." You will also note that our absolutely "Liquid Assets," amounting to £1.167.740, represent over 72 per cent. of the above total liabilities. For the sake of perspicuity I have presented our financial position to you today in a slightly different form from that of last year, and comparisons would therefore be useless.

Profit and Loss Account.

Turning now to the profit and loss account, you will note that the gross profit for the year under review, after allowing for depreciation written off and a largely increased provision for income tax, amounted to £346,185. Our working expenses, including war donations, staff bonus, etc., totalled £25.720, practically the same as last year. This leaves us with a net profit of £320,464, showing an increase of profit of £120.000 as compared with 1918. To this amount of profit must be added the sum of £161,796 brought forward from last year, making a total of £482,259. After deducting the amount of the dividend, £296,250, we are left with the sum of £186,009 to carry forward, an increase of £25,000. We have thus not only provided for all depreciation out of our profits, but have been able to increase the dividend by 2½ per cent., and to increase the carry forward by £25,000. Taking into consideration the circumstances under which we have been working, I am of opinion that your board have every right to be proud of the financial statements now submitted for your approval.

Diamonds.

I am pleased to be able to report that under the aegis of the control established by your permanent chairman, Mr. S. B. Joel, a few years ago, the diamond market has experienced an era of great prosperity.

Gold Mines.

Before proceeeding, as is customary at our annual meetings, to give you the latest information as to the mines of our group, there are two points to which I would particularly refer. As you are all aware, it was stated by the chairman of the Chamber of Mines some months ago that, in view of the increased burden of taxation, the higher wages demanded by employes and the increased price of stores, it would be impossible for some of the lower-grade mines to be worked at a profit, and that unless some relief could be obtained the question of closing these mines down would have to be seriously considered in the near future. A Commission has recently been appointed to deal with the position, and we shall await their report with the greatest interest.

The next point is the marketing of our gold. Since the 24th July, 1919, a free market for the sale of our gold has been conceded, by which arrangement we are able to obtain a considerable premium on the sale of our product over the price hitherto paid by the Bank of England. Exactly how long this state of affairs may continue it is impossible for me to forecast. The existing agreement with the Bank of England has been subjected to some very severe criticism from certain quarters, perhaps not fully acquainted with the position. The agreement is only of a temporary nature, and was, in the opinion of experts, the best that could be made in the interests of shareholders in gold-producing companies. When the South African Mint and Refinery are established facts the whole position can be again reviewed and other arrangements made if considered more advantageous. What exactly the effect of the establishment of a Mint and Refinery in South Africa will have on foreign exchange we cannot foresee, and the question is too complex for me to deal with on this occasion.

Consolidated Langlaagte Mines.

Results on this property have been satisfactory, considering the difficulties with which we have been faced. Development has been well maintained, and it is gratifying to be able to record the satisfactory improvement in the value of the reef, a feature which you will no doubt have noticed in recent quarterly reports. These values are chiefly due to the opening up of some high grade main reef leader in the West Deep Shaft.

At the moment the labour supply is especially low, and with any improvement in this direction we should soon be in a position to show an increase in the tonnage milled and profit.

Government Gold Mining Areas.

This mine continues to make good progress in practically every direction. The scale of development work has been well maintained throughout the year. There has been a slight falling off in the percentage payability, but this is more than counter-balanced by the very high values of the reef exposed. As a result of the policy of extensive development which has been steadily followed, the number of workable stope faces has recently been substantially increased, and in general the mine is being steadily placed in a position to give the best results. Although the property is popular with natives, the number available throughout the year has been much below requirements. We are hopeful, however, of a considerable increase in the near future, and this should soon allow of the reduction plant being run to its full capacity. Speaking generally, the prospects of the mine were never so bright as at present. At the end of October the ore reserves amounted to 10,127,000 tons, and in all probability a further increase on this figure, as well as an improvement in value, will be shown at the end of the year. It is obvious that it is unnecessary to continue the present scale of development indefinitely, and any curtailment of this work would have an immediate effect on the costs under this head, which have averaged 2.915s. per ton milled since the beginning of the year, whilst the labour released from this work would be available for general mine production.

Langlaagte Estate.

Development results on this property continue to show up well in percentage payability, reef width and value. The profits for the year, however, have shown a continuous falling off due to the shortage of native labour. At the end of October the number of natives at work underground had fallen to 2,181, the lowest figure reached for the year, or for many years. Shaft sinking is work that cannot be neglected, and at the present time this is a considerable drain on the small number of natives available. There is still a large area of undeveloped ground, and the prospects of the mine generally are quite good. It is to be hoped the present acute shortage of natives will soon be over and the mine enabled to work on a much larger scale.

New State Areas.

Sinking at the two shafts on this property is now making good progress. The south shaft passed out of the dolomite at 490 feet, and the north shaft at 638 feet. At the end of October the depth of the south shaft was 1,058 feet, the footage sunk for the month being 224 feet; the depth of the north shaft was 680 feet, the footage for the month being 215 feet. As both shafts are now through the difficult ground, a good rate of sinking is confidently anticipated. Our experience at the Government Gold Mining Areas has enabled us to lay out this mine on more economical lines than was the case at that time. On this property provision has been made for two main working shafts only, and consequently the whole surface lay-out is more compact than was the case on the Government Gold Mining Areas, where there are four main working shafts widely separated. Every care is being taken in the matter of capital expenditure, as the importance of keeping this as low as possible is fully realised. It will interest you to learn that from information obtained from adjoining properties we shall strike the reef at a lesser depth than I indicated last year, and it is anticipated that the reef will be intersected in both shafts within a year from now. It is our intention to order the first instalment of the reduction plant as soon as the reef has been struck, and every effort will be made to have it erected within twelve months from that date. It is obvious that the shareholders' interests will best be served by bringing the mine to the producing stage as early as possible. In view of the satisfactory developments in the adjoining mines, we have every confidence that this company will prove highly profitable.

Randfontein Central.

The dominating feature throughout the year has been the acute shortage of native labour. Native labour shortage has a very serious effect on this property, because the stopes, being steep and narrow, are quite unsuitable for machine work. Moreover, labour shortage detrimentally affects the grade of ore mined, as the richer sections are less popular because of their steepness than the low-grade areas, where mining conditions are more favoured with the native labourers. This unpopularity of the richer sections will be overcome when the new shafts are in operation. "Crushing in" in the workings of sections Nos. 2 to 6 has been severe, and has affected the shafts and some pump stations and engine chambers to a very serious extent. Delays in Sections 3, 4 and 5 have been numerous owing to caving shafts, and the condition of the shafts to-day is not reassuring. A bright feature is the progress made with the new work, namely, shaft sinking and the new hoisting and pumping scheme. At the end of October the new shafts—the north and south verticals—had reached a depth of 3,406 feet and 3,331 feet respectively. In September last the Randfontein leader was passed through in the north vertical shaft at a depth of 3,210 feet, having a dip of 60 degrees, and giving the satisfactory average value of 9.8 dwts. over a width of 48 inches. In the north vertical six main stations have been cut, and excellent progress made in excavating the pump chamber, the settling and storage sumps for the high-lift pumping plant at the 2,500 feet level. The first connection to the Robinson shaft is at this level, and will be connected in the course of the next few weeks. In view of the urgent necessity for bringing the north vertical shaft into operation as early as possible, it has now been decided to stop this shaft at about 4,100 feet. This will enable the shaft to be brought into commission about the middle of next year, and there will then be ten levels on tha shaft. The further sinking to the 5,000 foot level and the opening up of five other levels can be left to a later date. The main pumping plant at the 2,500 foot leval in this shaft is expected to be in operation about the end of April next.

The south vertical shaft, however, must be sunk to the 5,000 foot level before being brought into commission. The first station has been cut, and from now on a station will be cut every few weeks, but it will be well on towards the middle of 1921 before this shaft can be brought into commission. There are on order for these new shafts two electric winders capable of hoisting a five ton net load from a depth of 5,000 feet at a rate of 4,000 feet per minute. They will probably be the most powerful winding engines in the world. As the heavy expenditure necessary to bring the sinking and equipment of these shafts to completion cannot be met out of current profits, the Randfontein Estates Company, which holds the entire debenture issue, and 2,980,441 shares out of the issued capital of £4,500,000, has undertaken to finance the Randfontein Central Company to enable it to complete this vitally essential work, and your directors, in view of your large holding in both companies, have agreed to advance the Randfontein Estates Company such amounts as may be needed to meet its obligations to the Randfontein Central Company.

Van Ryn Deep.

Results from this mine have been eminently satisfactory during the year. There has been a steady increase in the tonnage milled and in the monthly profits. The amount of development work carried out per month has also been increased, whilst the values of the reef exposures have been excellent, and for the last quarter the inch dwts. of the payable reef exposed have been the highest in the history of the mine. There has been a little capital expenditure on providing the two underground winding engines with new electrical parts. This work has now been completed and the engines are giving every satisfaction. With the increased tonnage now being milled and the improvement in grade, the area of the amalgamating plates is scarcely sufficient. It has, therefore, been decided to add additional plates increasing the present area by 50 per cent. at a cost of approximately £2,000. Special attention is being given on this mine, and for that matter on all the mines of the group, to the careful and systematic washing of the stoped-out areas. It has been found that with the copious daily washing down that is necessary under the Phthisis Regulations a considerable amount of concentration of gold has been taking place; and this gold is recoverable only by a system of sluicing. It is clear that no matter how thoroughly stopes are cleaned out by shovels and brushes, there is still left a considerable quantity of high grade fines which can only be recovered under strong pressure of water. Careful records are kept, and from the results achieved on the various mines of the group this systematic washing of stoped areas is not the least important feature of the year's work. Altogether the prospects of the property are excellent. This company, as you are aware, took a participation of 10 per cent. in the flotation of the New State Areas, Ltd., representing 150,000 shares of £1 each. Under this arrangement the company took up and paid for 30,000 shares in full and paid 2s. per share on the balance of 120,000, leaving a liability thereon of 18s. per share, which has since been paid up. I am privileged to take this opportunity to inform shareholders in the Van Ryn Deep Company, in which your company is largely interested, that it has been decided by the board of directors to make a bonus distribution of the 150,000 shares to shareholders of the Van Ryn Deep Company registered at 31st December, 1919, pro rata to their shareholdings.

Witwatersrand G.M. Co.

This property has felt the strain of increased working costs more than most mines. This increase is due partly to the War, and also to the fact that the old outcrop sections of the property are approaching exhaustion, and work is confined more and more to the area around and to the south of the vertical shaft. Under these circumstances, a fall in profit has been unavoidable, but shortage of labour has combined to accentuate the poor showing the mine has recently made.

Development continues to expose ore of fair percentage payability and grade, and given a better supply of native labour improved results should be forthcoming. The main crosscut from the shaft at the lowest level (28th) is being driven, and we hope to intersect the reef at an early date.

New Unified Main Reef G.M. Co., Ltd., and New Primrose G.M. Co., Ltd.—These mines continue to make small profits. Mining work is now principally confined to reclamation. At the New Primrose a considerable area of main reef leader in ground acquired from the May Consolidated, Ltd. (in liquidation), is being opened up, and is giving satisfactory results.

Ginsberg G.M. Co., Ltd., and Glencairn Main Reef G.M. Co., Ltd.—Is June last milling operations were suspended at the Ginsberg property owing to the exhaustion of payable ore. Since this date work has been confined to the treatment of accumulated slime. At our last meeting I reported that mining and milling had ceased at the Glencairn Mine. This company is continuing to treat accumulated slime.

Altered World Conditions.

Gentlemen, for the past five years our meetings have been held whilst Europe was ravaged by the most devastating war known to history. It is indeed with heartfelt thanksgiving that I welcome you here to-day under somewhat more settled conditions. Although the Armistice was signed twelve months ago we are still, I fear, some considerable distance from a final peace settlement. The huge expenditure during the War has created many economic problems which will require the most careful handling if disaster is to be averted. The industrial position also gives cause for grave anxiety. I do not think the conditions of life can ever revert to the pre-war standard. Labour demands more of the social amenities of life by way of increased wages, better housing accommodation and shorter hours of work. Increased wages and shorter hours necessarily mean increased cost of production and consequently increased cost of living. It must, however, be realised by Labour that there is an economic limit beyond which concessions in this direction cannot be granted if Capital is to be profitably employed. The only solution of this difficult question seems to me to be increased production and greater economy. Since the date of our last meeting I regret to report that we have lost the services of one of our colleagues by the death of Sir Robert B. Llewelyn, for many years a valued member of our board in London.

I would here, on behalf of the board of directors, wish to express our appreciation of the work of the staff, both in Johannesburg and London, during the past year, and to extend a cordial welcome to those members who have returned from active service. Mr. Imroth is proceeding to England early next year, but I am pleased to state that he is not dissociating himself from the company, and I am sure that his many years' experience as managing director in Johannesburg will be of the greatest service to our board of directors in London. I know I am voicing your feelings in wishing Mr. Imroth a very pleasant holiday. Professor Lawn has left England for South Africa and will join the board of this company and act as managing director in Johannesburg.

Before I conclude my address, gentlemen, I must refer to the enormous loss South Africa has recently sustained by the death of the late Premier, General Louis Botha. A chivalrous foe, a faithful friend. He died in harness, giving his life for the land he loved so well. We are indeed fortunate in having a statesman of such proved capacity as General Smuts to take the place of the late General Botha as Prime Minister of the Union of South Africa; and I sincerely trust that under his guidance political strife may cease, and that all parties will unite and devote themselves whole-heartedly to furthering the prosperity of South Africa.

I now beg to propose that the directors' report, balance sheet and profit and loss account for the financial year ended the 30th June, 1919, as now submitted, be approved and adopted.

The Diamond Conference.

Mr. Gustav Imroth said: In seconding the report and accounts, I only wish to add a few words to the lucid speech made by your chairman. You are aware that your company is largely interested in the most important diamond companies in the Union. No doubt you have read with interest the statement recently made by the Minister of Mines in regard to the results of the Diamond Conference held in Pretoria, which has just completed its labours. The deliberations were of a very protracted nature, which is not surprising in view of their importance not only to the producers but also to the Government and the country. The four principal producers were represented at this conference, namely, the De Beers Company, the Jagersfontein Company, the Premier Diamond Mining Company, and the mines of the South-West Protectorate. The two main points which had to be decided were:

1. The policy inaugurated by your permanent chairman, Mr. Joel, which is control of production.
2. The manner in which that production should be disposed of.

On both these points satisfactory conclusions were reached, and arrangements have been made, to be in force for a number of years, by which the producers agree to regulate their output according to the demand. It was also decided to dispose of the production through one channel, and I wish to congratulate the producers on the eminently favourable terms they received. I have no doubt that the conclusions now arrived at by the conference will prove of benefit to all interested in diamonds, and when I say this I do not only refer to the large producers, but also to the river diggers and the smaller companies. The two points to which I have referred are essential in establishing stability in the diamond market, and I feel confident that the arrangements recently made will prove so satisfactory that they will be continued beyond the term of years now fixed. So long as this policy is followed, I feel satisfied that the price of diamonds will be maintained, that the producers, and consequently the shareholders, will derive the best results, and that the Government and the country will benefit largely as a result of the conference.

Au Revoir.

I thank you, Mr. Chairman, for your kindly reference to me personally. My association with this company has been of the most pleasant, and I hope will so continue in London, where I hope I shall be able to make myself useful. I first came to this company just on forty years ago, and therefore look upon himself as a South African, and I am not sure how life on the other side will appeal to me. I rather feel that at some time or other I shall be longing for sunny South Africa, and I therefore will not say good-bye to you, but au revoir. (Applause).

I now beg to second the adoption of the report and accounts.

The motion for the adoption of the report of the directors and the balance sheet was carried unanimously.

The retiring directors were re-elected, and the auditors reappointed.

The Board Congratulated.

Mr. Edgar Hyman congratulated the directors on the able way they had conducted the affairs of the company. The balance sheet was really a wonderful production, particularly in the way of expenses. When they came to think that the war bonuses, allowances, directors' fees, etc., amounted to a little over £25,000, they must admit that the company had been managed very economically. (Applause.) They were very sorry they were going to lose their able and genial managing director, and, as he had said, they hoped it was only au revoir. (Applause.) Mr. Imroth's services had been most successful, and he had been ably assisted by the board. He had always been accessible, and shareholders had always been able to see him to discuss the affairs of the company. He proposed a hearty vote of thanks to him and wished him bon voyage and a speedy return. (Applause.)

He also proposed a vote of thanks to the directors, which was carried with acclamation.

The chairman, at the request of Mr. Pemberton, undertook to bring the question of a superannuation fund for the employes of the company before the board of directors, and the proceedings then terminated.

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Notes and News

"Sold Out."

An apology is due to many would-be purchasers of this paper who were unable to obtain copies last week owing to the issue being sold out early on Saturday.

* * * *

Annual Meetings.

Annual meetings have been held during the last few days of the following companies: Consolidated Main Reef, Vereeniging Estates, and Zaaiplaats Tin. They will be dealt with in our next issue.

* * * *

Congo Gold Output.

The output of the Kilo and Moto gold mines in the Congo increased from 3,573 kilograms in 1917 to 3,605 kilograms in 1918. The expectations of last year will not materialise on account of the lack of native labour and of the non-arrival of the ordered machinery. Of the eight locomobiles bought, seven were requisitioned in Europe and but three have been delivered up to now.

* * * *

Miners' Hours and Wages.

The Chamber of Mines this week met the men's representatives, acting in conjunction with the Mine Workers' Union and the Federation of Trades, to discuss propositions which had been placed before the Chamber in regard to wages and hours. The requests on the employees' behalf are that there shall be instituted a 40-hour week bank to bank for underground workers and a 44-hour week for surface workers. In regard to wages the men are pressing for a consolidation of the war bonus; it is urged that consolidation of such bonus into pay should be on the basis of £2 8s. weekly, without any distinction between married and single men.

* * * *

The Arsenic Industry.

We have received information to the effect that the Goldfields Rhodesian Development Co., Ltd., have purchased a half-share in Standard Arsenic (Rhodesia), Ltd. A new company, which will be known as Standard Arsenic (South Africa), Ltd., has been floated with a capital of £50,000 to acquire the assets of the old company. An extensive development policy has been outlined, and it is understood that Mr. J. Buchanan will manage the company's mines and factories in Rhodesia, while Mr. W. B. Blyth will take charge of the works to be erected in the Union. The appointment of a first-class agricultural chemist is under consideration, who will attend to the technical side of the farmers' requirements in Rhodesia.

* * * *

Victory Diamonds.

Victory Diamond, Ltd., is one of the latest diamond flotations, and in view of the interest which this concern is engaging on the local market the following particulars will doubtless prove of interest. The company is registered in the Orange Free State. The nominal capital is £60,000 in 1,200,000 shares of 1s. each; issued capital, £41,625 in 832,500 shares of 1s. each; vendors' shares, £20,000 in 400,000 shares of 1s. each; working capital, £21,625 in 432,500 shares of 1s. each; reserve capital, £16,375 in 367,500 shares of 1s. each. The directors are Messrs. Leopold Lewe (chairman), Robert Kincaid Farrant, Vincent Charles Cloete, Marinus Wilhelm Lensvelt, Louis Charlston Goch, William Ingham. Secretaries, L. Charlston Goch & Co., 90-94 Exploration Buildings, P.O. Box 4122, Johannesburg. The property is the farm "Mahura Muthla," known as Rietfontein, district Kuruman. Diamonds of magnificent quality have been obtained from Mahura Muthla. The company's financial position has recently been substantially strengthened, and the company is now negotiating for the acquisition of another property in the Boshof district.

Far East Rand (South).

The annual general meeting of the Far East Rand (South) Gold Mine Selections, Ltd., was held last week, Mr. Harry Graumann presiding. The Chairman, in proposing the adoption of the report and balance sheet, said that the area of the property remained the same as at the date of the last report, and comprise 394 prospecting claims upon the farm Wilgepoort No. 244, and 100 prospecting claims upon the farm Daspoort No. 120, in the mining district of Heidelberg, held under Government licences and registered in the company's name. The financial position of the company was fully revealed in the audited statement of accounts presented. Work on the property had been continued, and the incline shaft was now down to 150 feet. The earlier promises had been confirmed, and the Van Ryn Reef section was justifying the best expectations. It was now a question of extensive work and development, and that could soon proceed on a proper scale under a scheme which would shortly be submitted to shareholders. The report was adopted, and Messrs. S. B. Dowling and S. Alexander, the retiring directors, were re-elected. The auditor, Mr. F. W. Diamond, was also re-elected.

* * * *

Prospecting in the S.-W. Protectorate.

Prospecting in the South-West Protectorate will be allowed as from January 1st, 1920, but no pegging will be permitted until 1st March, 1920. This is to enable prospectors from the outside to "get in." A prospector must take out a 2s. 6d. licence to prospect. He can work under this anywhere, except in prohibited areas, but must first provide surety up to £50 as a guarantee that he will carry out the mining regulations as regards the filling of shafts, etc. Copies of the amended Mining Law, together with a map of the country, will be available some time in January.

* * * *

Alluvial Diamonds: October Finds.

The output of alluvial diamonds at the river diggings during October was 8,050 carats, representing a value of £143,898. The number of registered claimholders was 2,369, and the number of diggers who registered finds was 1,106. In the Pretoria districts the alluvial finds weighed 2,539 carats, the value of which was returned at £15,197. Of 317 registered claimholders 137 registered finds. A diamond weighing 23¾ carats was found in the Modder B. Gold Mine, and one of 5¼ carats at Bultfontein, in the Ventersdorp district. These stones were assessed at £70 apiece.

* * * *

Percy Diamonds.

Active dealings have taken place on the Stock Exchange during the week in Percy Diamonds, Ltd., a company formed to acquire the mineral rights of the farm Sweethome, in the Winburg district. We understand that the property has been favourably reported on by Mr. J. Murray. The initial capital of the company is £12,500, half of which is set aside for working capital and guaranteed. We understand that from a sieve washing diamonds were found on the company's property, which were forwarded on the 16th September, 1919, with registration documents by the National Bank of South Africa, Ltd., Theunissen, to their Kimberley branch. The board of the company consists of Mr. Henry Adler, chairman, and Mr. P. V. Tiran, and the remaining directors will be appointed after allotment. A competent manager has been appointed and proceeds to the property immediately to continue active operations.

* * * *

The Result of the Diamond Conference.

Mr. Imroth voiced the satisfaction of the diamond mining industry last week at the results of the recent diamond conference. It is not often that agreements have been concluded between so many and such diverse interests, which can be said to have given satisfaction all round. The basis of arrangement clearly has to be the maintenance of the price of diamonds, and that means the control of the supply. The futility of producers selling their diamonds without regard to the world's demand has been repeatedly demonstrated, and from the taxpayers' point of view the desirability of a strict regulation of the supply must be evident. In the current year's estimates the Treasury expects to benefit to the tune of £420,000 from its sixty per cent. ownership in the Premier Mine and to the tune of £800,000 from the export duty on diamonds. Both these amounts will probably be far exceeded by the close of the financial year, but it is certain that if open selling were to be established, the prices of diamonds would heavily slump and the Government revenue would correspondingly decline. As regards the price secured by the Diamond Selling Syndicate, the new arrangement proposed is far more satisfactory to the State and also to the producers than that hitherto existing. The Syndicate has in the past received a ten per cent. commission for its share in the sale of the diamonds produced. Under the new arrangement the percentage is reduced to five. The stones are to be purchased by the Syndicate at a price five per cent. below the average price ruling during the preceding three months. If the sales are effected at more than the basis price, the profits will be equally divided between the producers, in whom, of course, both within the Union and in South-West Africa the Government is largely interested, and the Syndicate.

* * * *

South African Diamond Corporation.

The report of the South African Diamond Corporation for the year ended 30th June last states that the meeting to cancel the founders' interest in profits was held on 9th April last, when the following proposal made by the founders was confirmed, namely: "That in consideration of the option to them on 50,000 shares at 25s. and 50,000 shares at 30s. for a period of five years from the declaration of peace, they agreed to waive their interest of 25 per cent. in the profits of the corporation." The profits amount to £44,472, as against £35,114, enabling the directors to declare two dividends of 7½ per cent. and 17½ per cent. respectively, and to place £15,000 to a reserve fund which has been placed on deposit with the corporation's bankers. It is the intention of the board to augment the reserve fund yearly and to keep it liquid so as to be in a position to take advantage of any favourable opportunities for investment that may occur. The cash position of the corporation is very sound and the shares held in other companies taken at to-day's market value show a further very considerable appreciation over cost price as compared with last year. The diamond market has further considerably improved and prospects in this direction continue to be very favourable. The shares in the producing companies have advanced in value, but the prosperity of the trade is by no means yet reflected in their present prices. With regard to diamond cutting in the United Kingdom, a scheme will be presented in furtherance of the undertaking announced by the chairman at the last annual meeting, when he offered to give the corporation the right to join in this venture at cost price. It is proposed to pay an interim dividend of 5s. per share (being at the rate of 50 per cent. per annum) for the period ending 31st December next.

* * * *

Modder East and Apex Mill.

A letter, received in London in mail week, gives the following interesting comments on the Modder East programme: "Arrangements have been made with the Apex Company to do crushing for the Modder East. Their mine is about 7½ miles from the Modder East, but the railway passes through each property, and it is only a matter of putting a small bit of rail down and their arranging to rail the rock from the Modder East to the Apex. The mill is being cleaned up and the staff are now being engaged, and it is possible that within three months they will start crushing. This is a very bold experiment, but it looks like being successful. The agreement, I understand, is made with the Apex for six months. They will crush about 10,000 tons per month to start with. The cost of crushing and railage will only add about 2s. per ton to the working costs, and the company think it is worth the experiment. They have a good lot of Modder East ore developed, and if the crushing is successful they will be able to continue the arrangement after the six months. The position of this property looks exceptionally good."

TOPICS OF THE WEEK.

THE LOW GRADE MINES COMMISSION.

The evidence given before the Low Grade Mines Commission of late seems to have resolved itself mainly into two categories, namely, currency questions and mining economics. To the discussion of the latter several of our leading consulting engineers and mine managers have contributed interesting views, which merit being put on record in these columns. Mr. John Wessels, of the Robinson Deep, in his evidence showed himself to be a progressive mine manager imbued with modern views in regard to the handling of labour. Mr. D. T. Morton and Mr. A. E. Payne had something very frank to say about labour inefficiency. The former declared that the present efficiency of the miners was very largely due to lack of proper training. Efficiency of miners would become less year by year as the more experienced miners disappeared on account of phthisis. He advocated that the Government should take over a mine, even if such a mine were run at a loss, for the purpose of training miners, such men, on completion of training, to be drafted to other mines, and this would ensure the country having a sufficiency of skilled miners in years to come. He advocated all-round training. A man was handicapped by having specialised in one particular class of mining. Extra efficiency, he said, meant work for more men. Mr. W. L. White's evidence, briefly referred to last week, was most interesting of all. He said that if the Randfontein, the Witwatersrand, the New Primrose and the New Unified Gold Mining Companies suspended operations there would be thrown out of work 868 men at present employed, and the number of whites indirectly affected would be 7,812. Thus a total of 8,680 white persons would be deprived of their present means of support when the suspension of work took place on these four mines. What that meant was that when to these mines were added those others from different groups in a like category, or in worse straits, they were faced with the imminence of a contraction in the business life of Johannesburg and the Reef towns that must be disastrous. There would be many who, through old age or a lack of initiative or of funds, would be stranded on the Reef, and distress would become so acute that the Government would probably be called upon to face considerable expenditure on relief work, and, what was more, a large increase in the number of poor whites, of whom there were far too many in the country already. From the financial point of view, it was only to be expected that the effect of these four properties closing down would be very serious on the revenue of the country, so dependent as it was on the Witwatersrand mining industry. If they took the estimate made by the Dominions Commission in 1914, that for every ton milled the Rand contributed 9s. 4d. to the revenue derived from taxation and railway receipts as being correct, they would probably be understating rather than overstating the addition to the country's revenue from this source. Taking this figure, however, as correct, the loss to the country's revenue resulting from the closing down of the Witwatersrand, New Primrose, New Unified and the northern part of Randfontein would be in the neighbourhood of £596,000 per annum. Dealing with the attitude of labour, Mr. White said that numerous unnecessary employees were maintained in their billets by the short-sighted policy of the Labour Unions, and some managers were disinclined to retrench them in order to avoid raising trouble. Organised labour should declare its policy on this point, otherwise the position of the industry as a whole was hopeless, and beyond any real practical aid. Mining regulations were so stringent that the manager was more concerned with keeping himself out of Court than anything else. While there was a multitude of regulations to make mining safe, the system permitted the holder of a blasting certificate to carry on general mining operations after eight months' experience, but prevented a native with years of experience from doing so. Bureaucratic control had been overdone. During the War, he said, unified action by mining groups had been necessary. This control had been vested in the Chamber of Mines, and the functions of that body, at first honorary or advisory, have gradually become more and more executive. Such centralisation must be injurious, even if the Executive contained a larger sprinkling of mining men than it did. Managers were bombarded with communications, and much time occupied with extraneous matters not pertinent to the successful and efficient running of a mine. More assistance and less interference, coupled with a more sympathetic attitude by the Mines Department, towards the mine staffs, managers and officials would go far in any combined attempt to assist the low-grade mines. We believe Mr. White was voicing the opinion of many mine managers on the Rand in enunciating these views, and their ventilation from such a responsible quarter should have a good effect.

Union Mineral Output.

The mineral output for the Union in October was valued at £4,892,928, being an increase of £569,782, as compared with the September figures. The diamond output was 264,814 carats, valued at £1,547,138, the increase in carats being 37,527, and in value £474,910. The total gold output for the Union is returned by the Department of Mines as being valued at £3,078,576, being an increase of £106,965 on the output for the previous month. The coal output of 921,438 tons showed a decrease of 26,426 tons, the value of the output being £314,568. Of this the Transvaal produced 590,922 tons, a decrease of 14,500 tons. The Cape returned 403 tons, an increase of 46 tons. The Free State produced 67,022 tons, a decrease of 878 tons, while Natal produced 263,091 tons, a decrease of 1,094 tons. Sales and shipments of tin by the Transvaal and the Cape amounted to only 52 tons, which was assessed at £10,368. Labour returns show that 36,072 whites and 256,856 natives were engaged in mining in October, the former figure being an increase of 15, and the latter a decrease of 1,759 on the September figures.

* * * *

Bank Deposits and Advances.

The quarterly statements of the various banks trading in the Union are published in the last *Gazette*, and show the position as it existed on September 30 of the current year. The chief feature of the returns, when analysed, is again the rapid accumulation of deposits. In the three months which elapsed between June 30 and September 30 the total deposits, fixed and floating (including Government and savings bank deposits) showed an increase of about £3,350,000. Thus deposits are still accumulating at the rate of about eighteen per cent. per annum, and there is still not much evidence that they are being turned to full account for purposes of development. In June, 1914, the total deposits in the banks of the Union amounted to about £33,305,000, and of this no less than £31,170,000 was employed by the banks in the form of advances to their customers. That is to say, about 92½ per cent. of the total deposits was profitably employed. To-day the total advances to customers amount to about £50,068,000, which is only 63.8 per cent. of the deposits. If advances were to-day in the same ratio to deposits as they were in 1914, they would total about £70,560,000, and the inference is that, owing to existing conditions, the money which is profitably employed in the Union is about 20½ millions sterling less than it might be if the conditions were normal. The figures for the quarter ending September 30 are worth giving, with comparative details for previous dates:—

	Total Deposits.	Total Advances.	Per cent.
1919—			
Sept. 30	£78,133,639	£50,068,845	63.8
June 30 ...	75,075,830	49,900,150	66.1
March 30	69,323,099	51,168,098	73.8
1918—			
June 30	58,809,639	38,393,309	65.2
1917—			
Dec. 30	51,923,639	35,841,608	69.0
1914—			
June 30	33,305,186	31,170,243	93.5

Thus since June, 1914, deposits have increased by 136 per cent., and advances by 60 per cent. only.

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THE SILVER AND BASE METALS FLOTATION.

Very Favourable Reception—Issue Likely to be Largely Over-Subscribed—Prices of Silver and Lead Soaring !

Particulars of the new silver and base metals flotation were given in our last issue, and the prospectus will be found elsewhere in this. The company is called The Transvaal Silver and Base Metals, Ltd., and it is brought out under the auspices of the General Mining and Finance Corporation. The nominal capital is £70,000; of this 35,000 shares go to the vendor and 35,000 are offered for subscription. The vendor (the General Mining and Finance Corporation) has guaranteed at par the whole of the working capital in consideration of an option to subscribe for an equal number. Subscribers to the present issue will receive a similar option. In both cases the period is one year from 1st January, 1920. and the price 25s. per share. The new company. it may be repeated, acquires the freehold of two portions of Dwarsfontein 145 in the Pretoria district comprising 26 morgen, and prospecting contracts to acquire silver, copper, lead and base metal rights over other properties, in the neighbourhood of which there are lodes carrying ores of silver and lead. The holdings consist of (a) five more or less developed mines, which may quickly be reopened and extended in preparation for early production. These are the two mines of the late Transvaal Silver Mines on Dwarsfontein, the properties of the late Witpoortje Syndicate on Boschpoort 336 and Brakfontein 219, and the White Swan Copper. Encouraging results have been obtained on the previously untouched stretch of lode on Dwarsfontein, and a main shaft is now to be put down in the centre of the lode. It may also be repeated that in base metals ventures a wide margin is necessary to meet the possibility of variations in the market prices of the metals produced. At the present time lead is quoted round about £37 12s. 6d. per ton. We are in a transitional period between the cessation of munition manufacture and the coming period of rebuilding the devastated area and the resumption of industrial work in Europe. During this latter period it is very likely that lead will maintain a very high price. Home advices also promise a long continuance of the present high level of the market price of silver, now quoted at about 6s. 2d. per standard oz. It may be advisable at first to ship the concentrates to Europe for realisation, but later it should be practicable to deal with them at a central smelting and desilvering works adjoining the railway. This would produce fine silver for minting and export and soft lead from which the various requirements of the Union may in time be turned out locally. It will thus be seen that under the greatly more favourable conditions of to-day the re-opening and extension of the old mines become a most attractive mining venture, especially as ore which was quite below pay grade in 1895, will now yield a handsome profit.

PERSONAL.

We much regret to announce the death of Mr. James Ferguson, of the New Clare Smelting Works, which took place suddenly last week.

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We understand that Mr. W. Ingham, M.Inst.C.E., M.I.Mech.E., Chief Engineer of the Rand Water Board, has been elected President of the South African Society of Civil Engineers for the 1920 session.

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Mr. J. L. Wilson Goode, British Trade Commissioner at Capetown, has been appointed British Trade Commissioner at Bombay, and will proceed to India almost immediately to take up his new appointment.

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The appointment is gazetted of Mr. Ernest Shaw as a member of the Industrial Advisory Board during the absence from the Union of Mr. Archibald Crawford in connection with the International Labour Conference at Washington.

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The death recently occurred in Cornwall of Mr. Richard Quintrell Treloar, eldest brother of Mr. P. Q. Treloar (formerly a mine manager on the Rand). Nearly 40 years ago the two brothers went to America, where they were engaged in mining work. Returning to England in 1899, Mr. Richard Treloar next went to India, where he was occupied in important mining work in the Dependency for many years.

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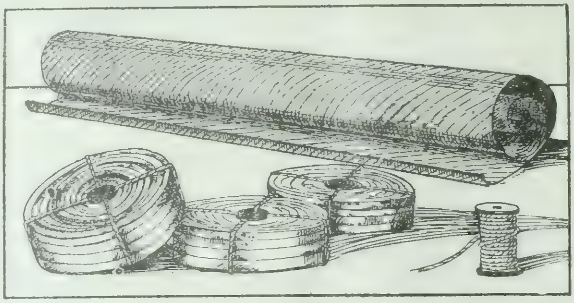

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THE PROGRESS OF RHODESIAN GOLD MINES.

Latest from the Shamva and Falcon—Goldfields Rhodesian to Dredge Rhodesian Rivers—Base Metals Position.

The annual report of the Goldfields Rhodesian Development Co., Ltd., contains the following review of some of the chief mines of Rhodesia, in which the company has an interest:

Report of the General Manager.

Antelope Mine.—This property, being situated so far from railhead, has particularly suffered from the increasingly adverse conditions arising as a result of the War, especially in regard to stores supplies and shortage of native labour, the latter being an urgent necessity in view of the depleted state of the ore reserves, to enable the sinking of the main shaft to be pushed forward, so that rock may be drawn from the body of good grade ore which is known to exist above the 14th level. The output from this mine for the twelve months ended May 31, 1919, amounted to £65,928 2s. 9d.

Eldorado Mine.—As indicated in my last report, the prolongation of the life of this mine to any extent was extremely problematical, and though during the year further prospecting work was carried out, the results only confirmed our opinion that the payable limits of the property had already been disclosed, and that no alternative remained but to mine and treat all the available ore in the most economical and profitable manner. This policy has been strictly adhered to, and for the year's working we were able to show a profit of £66,920 10s. 9d. from a gross output of £140,785 13s. It may be of interest to mention that at this mine operations have been carried out at a greater vertical depth than on any other property in Rhodesia to date, and also that during its twelve years of production it has yielded a gold output valued at £1,829,232 2s., from which, up to the date of this report, dividends to the amount of £726,300 have been distributed.

Falcon Mine.—The position of this mine has naturally been greatly affected by the considerable fall in the price of copper following on the conclusion of hostilities. As will be readily understood, the enhanced price of stores and material, as well as a further increase in realisation charges and loss of running time, occasioned by the influenza epidemic, and the frequent failure of deliveries of the mine's requirements of coal, resulted in higher working costs, which for the period under review averaged 49s. 1d. per ton, as compared with 45s. 6d. for the previous twelve months. It is, however, reassuring to note that, as a result of various economies effected at the mine, coupled with a reduction in realisation charges and an increase in the monthly tonnage treated, the working costs for May, 1919, were reduced to 38s. 7d. per ton, at which figure it is hoped they will be maintained. The Blister Copper output for the year amounted to 3,012·617 short tons, as compared with 3,615·981 short tons for the preceding period, the reduction being entirely due to loss of running time occasioned by the influenza epidemic and frequent stoppages on account of shortage of fuel.

Gaika Mine.—As a result of recent very satisfactory developments in the rubble section at the 3rd level, where a high-grade reef has been disclosed, the outlook at this mine at date is more promising than has been the case for a considerable time past. The ore reserves are [illegible] assisted by excess tonnage opened up in the course of mining from the stopes, the consequence being that, although 36,993 tons were crushed during the year, only 22,500 tons were withdrawn from the reserves. The value of the output for the past year amounted to £67,215 11s. 1d., of which £2,354 was placed to gold reserve, and from which a profit of £12,690 was obtained; and while the grade and tonnage were lower than in the previous year—thus accounting for the reduced figures—it is satisfactory to note that the average working costs at 28s. 2·4d. per ton show a reduction of about 2s. 2d. per ton.

Shamva Mine.—At the Shamva the results of the past year's operations are distinctly satisfactory, when allowance is made for the unavoidable loss of running time in the reduction plant on account of the influenza epidemic and the frequent shortage of coal, both matters entirely beyond our control. The operations resulted in an output of £000,473 19s. 3d., and a profit of £100,817 7s. 1d., whilst an amount of £120,000 was distributed in dividends, bringing the total dividends paid out to date to £652,500, equivalent to 108¾ per cent. on the issued capital of the company. The Eastern Extension and the South Parallel have continued to open up quite to our expectations, both as to the size of their ore bodies and their gold contents. A noteworthy feature of the year's operations has been the satisfactory opening up of the Cymric Hill section, highly payable values having been disclosed from the work so far accomplished, which is distinctly promising for the opening up of another payable ore body. It is quite apparent from present indications that the limits of the pay ore bodies on the Shamva Hill are by no means yet fully disclosed, and the large amount of excess ore which the stopes are continually yielding goes to confirm this. The last estimate of the ore reserves at the end of March, 1919, placed the figures at 1,993,000 tons of an average value of 4·3 dwts., equivalent to approximately £1,790,000 sterling.

Planet-Arcturus Gold Mines.—The Planet Mine tribute has come to an end so far as active milling operations are concerned, and except for the re-treatment of accumulated slime, work has been entirely suspended on the property. As regards the Slate-Arcturus sections, an agreement has been entered into with the Planet-Arcturus Gold Mines, Ltd., under which this company has the right to work these sections until such time as all moneys under loan have been repaid. The work of putting the shafts into workable condition is well advanced, and the construction of the extension railway from Ruwa Siding to the mine is progressing satisfactorily, and should be completed within the next two months, when the plant ex-Eldorado Mine will be sent forward for installation. It is hoped that, provided nothing unforeseen happens in the meantime, crushing operations will be commenced round about February of next year.

Asp Mine.—As regards this property, the work so far carried out by the option holders has been attended with satisfactory results, and the value of the mine has been considerably enhanced thereby.

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DIVIDENDS.

The gross amount distributed in dividends during the period under review by this company, and those under its management, shows a decrease on that paid during the preceding twelve months of 30·8 per cent., which is accounted for mainly through the Falcon Mines, Ltd., deciding not to make any declaration during the past year, owing to the very substantial drop in the price of copper since the Armistice, and the reduction in the rate of dividend payable by the Shamva Mines, Ltd. The total distribution amounted to £296,180 18s., made up as follows: Gold Fields Rhodesian Development Company, Ltd., 10 per cent., £125,711; Eldorado Banket Gold Mining Company, Ltd., 15 per cent., £45,000; Gaika Gold Mining Company, Ltd., 2 per cent., £5,469 18s.; Shamva Mines, Ltd., 20 per cent., £120,000. Data are not available relative to the dividends paid by Rhodesian companies generally for the twelve months under review, but those paid for the year 1918 amounted to £889,539—an increase of £44,047 as compared with the amounts distributed to shareholders in 1917.

MINERAL PRODUCTION.

The total value of the mineral output of Southern Rhodesia for the period under review was £3,623,248, being a decrease of £562,788, or 13·44 per cent. less than the total for the previous twelve months.

BASE METAL AND OTHER MINERALS.

Like the gold industry, the output of base metals and other minerals has shown a decline, though the actual declared value shows a slight increase, due to the adjustment, after realisation, of Asbestos declarations since 1915. The principal causes contributory to the decreased return were the restriction of shipping facilities, a temporary disorganisation of work due to the influenza epidemic, the heavy fall in the price of copper, and railway transport difficulties, as a result of shortage of rolling stock and damage done to sections of the permanent way by abnormally heavy rains in certain districts, and resultant floods. With regard to Asbestos, whilst the difficulties of transport and lack of shipping adversely affected the returns during the past twelve months, the outlook for this industry continues to be very promising, particularly so in regard to the Rhodesian and General Asbestos Company, Ltd., in which this company holds a large interest, and which paid two interim dividends of 5 per cent. each for the year ended 31st March, 1918; whilst the results for the year 1918-1919 will, it is expected, justify the distribution of a further dividend at an early date. The decline in the copper production is almost wholly due to the considerable drop in the price of the metal since the cessation of hostilities, which has been particularly felt by the small producer, who, in consequence, is practically non-existent to-day.

GOLD DREDGING.

In view of the success attained in dredging for gold in the Manica district of Portuguese East Africa, interest has been revived in the gold dredging possibilities of Rhodesian rivers which drain the various gold belts. In this connection we have applied for and secured provisional reservations over considerable areas on the Mazoe and Umniati Rivers for the purpose of our investigations, and have been fortunate in obtaining the services of a man who has had considerable experience in gold dredging to proceed with one of our engineers to thoroughly test the various areas.

The list of certificates issued by the Mines Department for the period ending 30th November, 1919, is as follows: Mine Overseers (Metalliferous Mines): P. Drummond, C. A. B. Eayrs, T. C. A. Julyan, P. W. T. Roux.

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RHODESIAN MINERS' STRIKE AVERTED.

A Conference Held—Hours to be Reduced and Wages Increased.

For several weeks there have been rumours of further demands being made on behalf of the workers on mines in Southern Rhodesia, and much correspondence has passed between the recently formed Mine Workers' Union and the managements of the various properties. The requests as finally formulated on behalf of the men were for a twenty-five per cent. increase in all present wages, apart from the war bonus, which it was suggested should be abolished. Naturally, the mining companies were not disposed to acquiesce in such a demand without going carefully into the whole matter and hearing upon what grounds it was based. Equally naturally, the men, or those who are acting for them, brought forward the argument of the increased cost of living. A general advance in wages may mean a further restriction of the Rhodesian mining industry by the closing down of some of the mines. The matter went so far that a strike was threatened, which was to have been called for last week over practically the whole of the mines of the territory, including both the gold producers and the Wankie coalfield. This strike has fortunately been averted. Several of the managements expressed a willingness to meet the men's representatives and talk the matter over; but the latter insisted upon a general conference representative of all the mines on the one hand and of the newly-established labour organisation on the other. The general secretary of the Mine Workers' Union states that the strike has been " called off " on the understanding by his union that such a conference will take place. Part of the demand is that in the matter of a permanent wage increase no distinction shall be made between married and single men, as was done in the granting of the existing war bonuses. There have, of course, been other wage increases than the bonus during the past few years, while the working hours of the men have been substantially reduced, especially on some mines; the Falcon and the Shamva can be mentioned in this connection, while a special arrangement was made in respect of wages and hours at the Globe and Phoenix which the workmen agreed to recognise until the New Year and the return of the general manager, Mr. Theo. Haddon. A point upon which the new union is keen is the securing of a uniform 48 hour week, such as already obtains on several important properties except in the case of actual miners, who get paid at the rate of time-and-a-half for work which exceeds that average. It is asserted by the men's organisation that the average wage paid to miners in Southern Rhodesia is from £1 to 25s. per shift, while the mechanics get 2s. 10d. per hour, and the war bonus is put at an average of 25s. per month, though many men get considerably more from that source.

Crescens (Matabele) Mines and Land.

The report of the Crescens (Matabele) Mines and Land Company for the year to June 30 last states that the accounts show a profit of £8,624 and £744 was brought in, making £9,368. Before arriving at this figure, however, the profit credited in respect of a farm sold in 1916 has been cancelled and written back, the purchasers having failed to carry out the terms of the sale agreement. The directors recommend a dividend of 10 per cent., less tax, which will absorb £5,090, leaving £4,278 to be carried forward. During the year farms comprising 45,179 acres have been sold. The total acreage held by the company as at June 30 last was 400,219 acres, or about 625 square miles. The Veracity claims continue under tribute, and the company has received royalties for the year amounting to £772.

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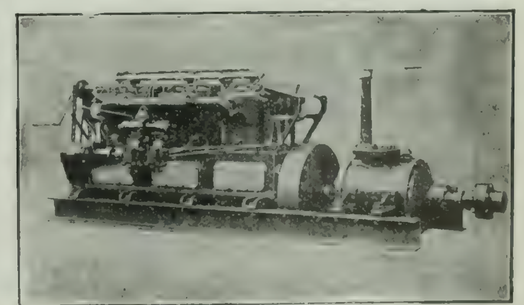

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THE OUTLOOK FOR GLYNN'S LYDENBURG.

The report for the year to July 31 last states that the number of claims held in the previous year was reduced on survey by nine. Two fresh claims were pegged during the year, and there is thus a net decrease of seven in the number of claims held by the company. Ten stands were sold in Sabie Township during the year. The net profit amounted to £9,962, to which must be added £30,427, brought forward from the previous year, £1,049, funds transferred and £54 unclaimed dividends written back, making £41,492. This has been dealt with as follows: Union and provincial taxation, £2,393; dividends Nos. 35 and 36 of 2½ per cent. each, £8,500; carried forward, £30,609, made up as follows: Shareholding in Rand Mutual Assurance Co., Ltd., £178; stores, live stock, vehicles, furniture, and sundry debtors, £14,462; net cash after providing for all liabilities, £15,969—£30,609. The amount appropriated for taxation includes £746, paid under the Provincial Gold Profits Tax Ordinance to the Province of the Transvaal. An action brought by the New Modderfontein G.M. Co., Ltd., to test the validity of this ordinance was decided in favour of the Provincial Council of the Transvaal, and this decision was confirmed on appeal. Mine development suspense account is reduced to £6,458, by writing down mine development account in respect of the reduced tonnage of ore reserves. Mynpacht No. 2 prospecting expenses account has now been merged into mine development. Operations at the mine were severely affected by the epidemic of influenza which occurred in October, 1918 and led to a very serious shortage of native labour after it had passed. Water difficulties continued to be severe in the Werf section for the greater part of the year, but it is believed that the provision which has now been made for coping with them will prevent any serious recurrence. Mine stores have continued to increase in cost, and have restricted profits accordingly. The arrangements for the disposal of gold during the War period having come to an end, the necessary facilities for a free market in gold have now been obtained, and it is hoped that this will result, at any rate for a time, in an increased price being realised.

The consulting engineer's report shows:—

	Year to July 31, 1918.		Year to July 31, 1919.
Total tonnage milled ...	46,964	...	37,982
Yield per ton	37s. 9.5d.	...	37s. 0.3d.
Working costs per ton...	26s. 7.5d.	...	33s. 4.1d.
Profit per ton	11s. 2.0d.	...	3s. 8.2d.
Total working profit ...	£326,236	..	£6,988
Sundry revenue...	£3,605	...	£2,974
Ore reserve—tons	138,928	. .	108,546
,, —dwt	9.8	. .	9.4

The year's results have been unsatisfactory in every respect. The tonnage has diminished considerably and operating costs have increased by no less than 6s. 9d. per ton. This was primarily due to the influenza epidemic which invaded the mine in October, 1918, causing severe mortality among both whites and natives, and an almost complete cessation of work. The mine has not yet recovered from the effects of the epidemic, which is still prevalent in the district. Although the influenza was certainly responsible for the major portion of the increase in working costs, the extra cost of practically all materials and of white labour has contributed to this result. Considering the shortage of native labour, satisfactory progress was made both in reclaiming the Werf section and in development at Compound Hill. Unfortunately the latter is not looking quite so promising as it did last year, but it is quite likely that the falling off in development values is only temporary. The ore reserves are lower, partly because comparatively little development was done and partly because the increase in working costs has rendered certain blocks of ore unpayable. What with heavy rains at the beginning of 1918, which caused the almost complete effacement of the Werf mine, and the influenza epidemic, the company has had an undue share of ill-luck, and it appears that it will yet be some time before it completely recovers. The most important desideratum for bringing about this result is an improvement in the native labour supply.

The following additional information appears in the latest quarterly report:—Compound Hill: The main drive going south has advanced 162 feet. Values have improved slightly. The formation is still favourable for a payable lode. The drives going east from this drive are in payable ore. Werf Mynpacht: The position is improving. The main workings are gradually being drained, but there is still an abnormal quantity of water in the mine. Prospecting: A drive is being pushed northwards towards Compound Hill and another towards the east. They are at present both above the lode, which is below water level in the bed of the creek, but as the drives advance they will reach more settled country and we shall be enabled to get on to the lode. Labour: During the quarter native labour has been exceptionally scarce, but is now improving somewhat; about 12,000 underground shifts less were worked than during the previous quarter. This accounts for the low tonnage milled and consequent high cost per ton milled.

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Write, or call any evening except Mondays and Fridays.

COPPER PROSPECTS IN NAMAQUALAND.

A Favourable Report—Many Ore Occurrences Examined—Solomon Syndicate Enterprise.

In a report to the directors of the Solomon Syndicate, Ltd., Mr. E. M. Weston writes:—In accordance with your instructions I proceeded to Namaqualand to inspect three groups of mining areas, viz.: (1) In the South Namaqualand copper field around Concordia and near the Spectakel Mine. (2) Properties under option between Steinkopft and Henkries on the Orange River. (3) Properties in the Richtersveldt or North Namaqualand district, situated in the bend south of the Orange River.

TITLES.

All the mining properties in these areas are held at present under prospecting licences which protect an area (circular) for 1,200 yards from the prospector's peg. Those areas which it is decided to retain will need later on to be surveyed. A lease to cover all this ground necessary for mining purposes can then be applied for and held at an annual rental of about 2s. per morgen. Prospecting areas can be retained indefinitely and as prospecting discloses the extent of the ground it is necessary to retain, permanent leases may be applied for.

SITUATION.

Of properties held by the Solomon Syndicate in this portion of Namaqualand, these, with one exception, lie within five miles of the railway line near Concordia. The Schaaprivier Triumph area lies in the valley of the Buffels River about 20 miles by road from Anenous, the station at 50 miles peg on the railway and at 1,000 feet above sea level. The other properties are on the plateau at elevations of 3,000 and 4,000 feet. Of the properties pegged by your prospector, in my opinion only the following five areas can be classed as having any interest to your Syndicate. The remainder may indeed contain untold wealth, but the only evidence of it is a slight copper staining in places. The five areas are:

RIETWELL.

This area may be of some value as, though there is no appearance of payable ore, the staining of green carbonite of copper (malachite) is well pronounced and occurs over a considerable area. This may indicate the presence in depth of a deposit of low-grade ore suitable for concentration.

RIETBERG.

This ore body lies high up on the steep west slope of the Rietberg Mountains and about two miles from the railway. From this a branch line could be easily led to the foot of the mountain and ore sent down to it by a self-acting aerial tramway. Considerable work was done here by the house of Neumann before 1901. These workings, mainly from winzes in tunnels, are now inaccessible, so I was unable to prepare a plan. This, however, I think can be procured. The ore body which is a mixture of bands of quartz rock, ore-bearing dyke, and gneiss is about 500 feet long on the surface and up to 100 feet in width. It shows for a vertical depth of about 200 feet on the steep side of the mountain and it could easily be quarried out in trenches to a depth of several hundred feet. The oxidised capping shows bunches and stains of malachite very freely and a proportion of ore going 5 per cent. copper and over in value could be sorted out. Indeed several trial parcels have been sent away. In a winze from the lowest adit the dyke carries copper pyrites in lumps and patches. The dump at surface has a value of 2 to 3 per cent. copper. The opinion I formed was that this large ore deposit could be very cheaply worked, and that from the oxidised zone copper ore of a grade high enough for local smelting could be sorted out. In depth a selection of the sulphide ore from the bands of waste should give a product very suitable for concentration. There is also the probability that a rich body of ore may be met with, as only a small proportion of the area of the ore body has been explored. Indeed the outcrop to the east running into the mountain has not even been trenched, and where exposed shows promising indications. I found that the Cape Copper Company has recently sent someone out to peg this deposit. However, the original peg belonging to the Syndicate was in position. To sum up, this ore body has always been considered to be of promise and, though work did not disclose ore of high enough value to export with profit, the work done so far has not exhausted the possibilities of the deposit. I am of opinion that water could be found in the vicinity in sufficient quantity to operate a concentrating mill, but more work would be required before any reliable estimate could be made as to tonnage and value available.

BLANDKLOOF.

This area lies on the eastern side of Rietberg mountains, about one mile from Rietberg Mine. The dyke showing here is on the same line and may possibly be the same dyke running right through the mountain. The dyke, most of which is barren, runs up a spur of the mountain as shown in the sketch plan. Very little work has been done. An open cut and shallow shaft have exposed an enrichment in the dyke to a depth of 15 feet. The outcrop, which shows malachite very freely, is about 40 feet wide at this point. The mouth of the shaft is 100 feet above the valley and the favourable rock showing copper can be traced right down to the spur on the north side to the level of the valley, where it is to the east covered with soil and has not been prospected. At the bottom of the spur a shallow cut shows copper stains in a quartz rock similar to that at Rietberg. The enrichment can be traced up the hill for a distance of about 300 feet, and seems to lie alongside a quartz reef which appears white and barren on the surface, but where broken into shows malachite. The ore body in the shaft is very full of magnetite and shows considerable copper ore in the form of malachite. A considerable portion of ore in the bottom of the shaft has value about 3 per cent., but the shaft is too shallow, and the work done too small to judge what the value of the ore in the sulphide zone would be. This outcrop has a most promising appearance. In the south side of the spur and about 600 feet to the west occurs another large enrichment. Two shafts 30 feet deep have been sunk upon this. The ground excavated shows copper stains, but the rock appears to be very much leached and deeper sinking would be necessary to prove if any payable ore occurs. On the opposite side of the valley to the south another dyke has a cut in it, disclosing copper stains. This does not present a favourable appearance. Conclusions: Certainly this outcrop has been neglected. The manager of the Namaqualand Company apparently did not know of its existence. The indications of the presence of a body of sulphide ore in depth of a value at least good enough for local treatment by concentration or smelting are quite favourable enough to warrant future work.

HOOGKRAAL.

This area lies about 1½ miles west from the famous Tweefontein Mine and apparently encloses the same line of dyke or one closely parallel. It is of the same petrological composition as Tweefontein, and the composition of the enrichment in it is also similar. I was rather surprised to see that, except for the work shown on the accompanying plan which was done by a private person very many years ago, no prospecting work has been carried out at all in this direction. The dyke on this area is very persistent and is covered with soil and overburden for long distances, yet these have never been sunk through to see if the dyke carries ore beneath them. The plan shows quite a large area of the dyke at one place to carry an enriched portion.

Copper stains and malachite show on the surface and in the shallow cuts and shafts, and there is evidence that leaching action has gone on near the surface. The sample assaying 7 per cent. copper which show bornite in fine specks very regularly distributed through the rock came from the bottom of the shaft 20 feet deep. This is evidently just entering the sulphide zone, and the presence of such ore is highly encouraging. The value of the ore showing on the surface is not more than one or two per cent. copper; but evidently sinking to 100 feet and doing some driving would disclose some ore of higher grade. Owing to sand and debris it was not possible to trace out the exact limits of the enrichment which is mixed in places with barren dyke. It will be seen from the plan, however, that its length is from 500 to 600 feet and it shows in one place a width of over 120 feet. Conclusions: This also can be classed as a very fair prospect indeed because of its situation and surface showings.

Schaaprivier (Triumph).

This area contains a dyke of very favourable appearance wherever it can be seen on the surface. The Namaqua Company some years ago had this area on verbal option from the prospector. The only work they did was to sink one shaft 120 feet deep where the dyke shows 20 to 30 feet wide on the surface. When it came to signing a formal agreement the prospector increased his demands to such an extent that they shut down work. No other work has been done and not even a trench put in. I traced this dyke some 500 yards up the mountain to the east. The dyke is covered with overburden for a large proportion of that distance. Where seen it is all of good appearance and for all one knows there may be a rich shoot of copper ore somewhere on the surface. The dyke is heavily charged with magnetite, and in the shaft workings shows copper pyrite, but not in payable quantities. Malachite shows at the highest point to which I traced the dyke up the mountain. To the east the dyke shows more barren rock, and it appears to pass under the overburden in the Buffels River valley. Conclusions: This dyke is practically unprospected and could be easily explored by adits. Further work, if it be only surface trenching, is certainly justified. This is certainly the most favourable looking unprospected dyke in the district, and its extent on the surface is rather remarkable. It may branch towards the east.

General Remarks.—These four last areas may be described as favourable prospects for the district. These occurrences indeed show no ore above 5 per cent. copper in value on the surface, though some was selected and sent away from Rietberg. To those people who are prepared to spend a small amount of money in a legitimate and promising search below these outcrops for some of those really rich copper ore bodies that have made the district famous, I can recommend these properties.

Properties Under Option between Steinkopft and Henkries.

I examined all these properties except those stated to contain iron, corrundum and asbestos. The asbestos samples shown were of no value. Iron ore is not of value in this district, and the corrundum deposits are not suitable for development by a company. Of the rest of the areas examined, including the Henkries Mine, without going into details, I can only state that it did not appear to me to the advantage of this Syndicate to interest themselves in this portion of Namaqualand at present. The mica claims are not attractive to a company.

Properties in the Richtersveldt.

I should divide the ore occurrences in the Richtersveldt into the following classes:—

No. 1.

(a) Deposits of copper ore in the tillites and slates in bodies of quartz veins, with a N. and S. fissuring, and in the slates as at Numees and Numees South.

(b) Copper ore connected with E. and W. fissuring, and extensive silicification occurring in quartzite overlying the Numees tillite, and apparently passing into it in depth as at Rabinowitz No. 1 area.

No. 2.

(a) Deposits in the old gneiss which show marked jointing and cleavage and schistose structure. These comprise impregnations of copper ore with a certain amount of secondary silicification and development of irregular small quartz leaders. The gneiss and quartz veins both carrying copper as seen in the river bed of Tatasberg River and the hills adjoining, 300 feet and more in width.

(b) Similar more intense zones of mineralisation at Tatasberg in the gneiss, in which the copper ore occurs following the course of the intrusive dykes on both sides, and clearly due to their action, as the dykes themselves carry copper ore.

(c) Similar zones of mineralization in the gneiss which however follows the course of very large and persistent quartz lodes which have a general N. and S. strike. In most places these appear to be barren at the surface.

No. 3.

(a) At Fannings Mine where such a quartz lode has had cuts put in it, it is seen to contain grey copper ore and malachite. This is true of a place three miles N. of Fannings Mine on the same immense quartz lode. At Tatasberg the quartz lodes also show copper stains in places but have never been broken into.

(b) Similar quartz lodes traversing bornblend schist on the N. side of the Tc Oulyroup mountains. These have a different strike and the primary copper ore appears to be native copper.

No. 4.

Irregular quartz fissures carrying copper ore in the old gneiss and schists but having no particular strike. These are seen at the Isabella Mine and Rabinowitz No. 2 area.

Description of Areas Held by the Solomon Syndicate Numees and Rabinowitz Extension.

These pegs cover the south extension from the Numees boundary of the ore-bearing slates and quartz veins in the tillite, which in future I will refer to as the Numees slates. The area extends for about 4,000 feet up Hell's Kloof. I discovered a typical Numees body showing copper in the schist and quartz leaders and associated with calcite veins beyond the south boundary of Numees Mine. The Numees slates can be traced right up Hell's Kloof, the quartz veins, which however have not been prospected or even examined closely, appeared to be leached on the surface. Slightly to the east, however, up a side kloof leading to Rabinowitz's area on breaking one it showed copper ore. I was also fortunate enough to discover half way up the kloof typical bornite veins in the slate. I am strongly of opinion that a little intelligent prospecting will disclose bodies of copper ore in this area. I pegged the extension of these slates to the south as far as they showed any favourable features. Leaching and oxidization is much in evidence and copper ore cannot be expected to show freely on the surface. Not a pick has been put into this ground. The kloof rises steeply from 400 to 700 metres and ore bodies if found could be developed by tunnels.

Fannings or Fennings Mine.

Shortage of films prevented me from procuring a photo of this occurrence. Running north and south for several miles from a point north-east of the "Gold Fields," which is so named because about 20 oz. of alluvial gold were found there, and crossing the dry river bed below this place a line of outcrops of white quartz lodes are a prominent feature of the landscape. These are apparently barren, but a short distance north of the road the old workers have put in a cut disclosing copper ore beneath a few stains of copper on the surface. Of this all that can be said at present is that the occurrence deserves further opening up so that its extent and value can be determined. I pegged this area for the Syndicate. This line of lode can be seen running south showing immense bodies of quartz. Fanning Mine is situated towards the southern extremity of it. I pegged the intervening area for the Syndicate to allow of a proper examination of the whole line at a later date. Fanning Mine was opened on a kopje of white quartz standing 120 feet above the dry river bed that has cut through it on the north. This kopje is 600 feet long but the lenze of quartz is 1,000 ft. long or more. The quartz is apparently white and barren except for a few copper stains right at the top towards the north end. The old prospectors put some shots in these places and disclosed malachite and grey copper ore. Assays show ore of a value of 6·15 per cent. Cu. average, and a special sample assays at 27·8 per cent. copper ore. Encouraged by this they went half way down the kopje and started the approach to a tunnel in barren looking white quartz. At a depth of 5 to 6 feet, having again encountered ore of similar value and still further encouraged they went down to the level of the river bed and blasted out a long approach for a lower tunnel that would have cut across the kopje at a depth of over 100 feet. Then for some unknown reason work was abandoned and has never since been resumed. They sunk a shallow shaft also at the base of the kopje at the dry river bed and again met ore. These openings are all in the northern third of the kopje and the surface of all the rest presents the same hopelessly barren appearance. This occurrence of ore alone should have taught the prospectors in the Richtersveldt, where leaching and bleaching agencies have been even more active than those of denudation, not to expect to see copper ores or a copper mine sitting up like a meercat and beckoning to them. However, the lesson seems never to have been learnt. The greatest width of quartz seems to be about 70 feet where the tunnel would crosscut it. I cannot predict how much of the kopje will be ore bearing. Certainly the tunnel if continued should disclose a large ore body. There is every encouragement to drive this tunnel and to put cuts in other barren looking portions of this great fissure lode whose barren and bleached outcrop may in other places conceal bodies of copper ore as in the places mentioned further north. If one takes the average width of Fannings quartz lenze at 20 feet and its length at 1,000 feet and 10 cubic feet to the short ton, it will yield 200,000 tons per 100 feet in depth. At present I can only say that this seems to be a prospect that has a chance of development into a large mine and its prospects can be cheaply ascertained by driving a tunnel 150 feet and putting in cuts all over the kopje.

KOOISABIES OR NOOISABIES.

This ore deposit showing native copper lies on the north flank of the Te Oulyroup mountains about four of five miles south-east of Fannings Mine; between them there is a great break, and the strike of the lode and schist is more to the west. It occurs on one of the lower spurs shown on the accompanying photo. As mentioned, there is a spring two miles away and also six miles away at Conu Gariep. A rough wagon road up the bed of a boulder strewn sandy bed of a dry stream leads to within a mile or so of the mine and could be easily improved and extended. I had not read Dr. Rogers' paper before the Geological Society, and had heard so much nonsense talked about the native copper that I half expected to see some strange and inexplicable phenomena of ore deposition. The facts are plain and most simple, requiring no theory for their explanation. Along the side of the spur and in places forming its crest occurs a long line of fissuring marked by the occurrence of large lenzes of quartz which traverse hornblende and other schists. These quartz lodes are in most places apparently barren at the outcrop; but in places, especially towards the east, show copper staining. Where the discovery was made at an altitude of 619 metres the quartz lode contains native copper apparently as a primary mineral. This has been unknown before in South Africa, though native copper has often been met with as a secondary mineral; the best known other occurrence is the copper mines of Lake Superior, U.S.A. Native copper occurred here in very large masses in the lode, and during the course of denudation the large piece shown in photo, which may weigh anything between 1½ and 3 tons, has rolled down off the outcrop and lies in a steep water course. Along the outcrop, principally on the north side, numerous large pieces were taken out. The total quantity carted away was about 2 tons. These pieces occurred along a length of about 15 yards. Later on, on the south side of the quartz lode, which is here about 20 feet wide, where a few stains of malachite only were showing on the surface a shaft was sunk to a depth of 8 feet and at about 5 feet in depth lumps and irregular branching patches of native copper are showing in the white quartz, and the chloritic material and hornblende schist on the walls begin to show signs of being copper bearing. The native copper occurs in payable quantity and is more or less altered first to cuprite and then to malachite. The Government Geologist states that he also observed sulphides of copper, but this I am unable to confirm. There is no doubt that the lode here over a large or smaller area carries a somewhat remarkable deposit of native copper. It is impossible to predict what its extent may be, and the presence of copper staining in other places may be interpreted in the light of the experience met with in sinking a small shaft and at Fenning Mine and elsewhere. However, nothing but further work can tell what the value of this discovery is. It may be only a patch; but on the other hand, as far as my observations go the mineralization in the Richtersveldt is not patchy. Certainly it is a most promising prospect. There is every facility to cheaply ascertain the extent of the enrichment; as the hill is very steep and by going 150 feet down and driving an adit along the lode a depth of 100 feet will be gained beneath the shaft. The lode can then be crosscut and the width and length and depth of the ore body proved. Great facilities exist for working this line of lode by adits to a depth of at least 300 feet. If all the ore in this lode occurs as native copper the ore can be hand picked on the mine, thus giving a high-grade product that will bear high transportation charges. Work can only be carried on for some time on a small scale as for most of the year water will have to be packed on muleback from the spring two miles away.

ISABELLA MINE.

The position of this outcrop more than 300 feet above the river is shown in the accompanying photo. Its position is shown on the map about four miles north of Tatasberg. This is an irregular line of fissuring containing quartz filling with copper ore in some places and sheared gneiss impregnated with copper in others. By driving in on the lode from the river 300 feet of "backs" are available. The strike is near north and west, workings consist of a shaft and cut about 12 feet deep which does not disclose the full width of the formation. An irregular quartz lenze shows in the shaft up to 4 feet wide carrying patches of malachite. In the bottom of the shaft the formation is 6 feet wide and about 12 inches of sheared gneiss assays 1·6 per cent. copper. Further up more copper ore shows. The lode is cut in two just near the shaft by a dyke of basic hornblende rock. It has been traced about 450 feet west from the cliff edge and may run east under the river. Towards the east and 30 feet north of the lode an irregular impregnation of copper ore shows in the gneiss. Owing to surface leaching it is impossible to say what its extent or value may be. In places on the surface the lode shows three feet of copper bearing quartz, but the outcrop is considerably leached. It is hard to estimate the value of this small lode. It would certainly yield a proportion of ore of the value of between 3 per cent. and 10 per cent. and the possible tonnage of ore above river level taking, an average width of two feet would be 15,000 to 18,000 tons. If the river can be used for transport this property might in the future be worked with the others.

TATASBERG AREA.

This mineralized area on which three original prospecting areas are pegged and on which I pegged another prospecting area to the north is shown in the sketch plan attached, also in three photos. I very much regret that owing to a breakdown in my transport arrangements I was unable to make a proper survey of this area and to furnish a dimensioned plan. The extent of the area described can, however, be judged to some degree from the photos and the approximate distances given on sketch plan thus checked.

Area of Copper Impregnated Gneiss.—In the dry river bed of the Tatasberg river where the gorge has cut through the hills to a depth of 200 to 400 feet, copper ore can be seen in small quartz veins and impregnating the gneiss for a width of about 300 feet. The average value is apparently very low, but the copper contents vary considerably. Typical assays show ·95 per cent. copper, a vein containing 6·5 per cent. copper and 3½ silver. The impregnation can be traced for a long distance and the amount of material available runs into tens of millions of tons above the river level. One hesitates to describe such an occurrence of copper bearing rock as a deposit of copper ore, but on the other hand where such vast tonnages of copper bearing material occur as to really justify the use of that much-abused expression a "mountain of copper," and where such material could be mined by quarrying or caving methods, and perhaps treated by one of the cheap modern leaching or concentrating methods, and where unlimited water with the possibility of generating electric power is found close by one hesitates to say that such a deposit is of no value. Later on this deposit will deserve careful attention and sampling to see how the richer portions occur; meanwhile it may be neglected for the richer occurrences. As already mentioned these occur associated with quartz lodes and intrusive dyke, these lie to the south-east of the larger impregnations, as shown in the accompanying plan, for a distance up to 50 feet on each side of the dyke and the quartz lode the gneiss shows copper ore and copper stains in sufficient quantities to cause the Hottentots to give the mountains the name of Tatasberg (copper mountain). The gneiss outcrops have every appearance of containing copper ore in payable quantities. The total length of the impregnated zone as I saw it is at least 1,500 feet and is probably much greater, as grey copper ore shows in a small working in the gneiss alongside the apparently barren quartz lode at Cut a on plan. This is 650 feet below the ridge shown in photo, where the best ore occurs on the surface, and over 1,000 feet nearer the river. The ore-bearing dyke also runs at least 1,000 yards south towards Tatasberg mountain and appears from the distance to be accompanied by mineralised rock of the same appearance as were examined. The sample assaying 15·4 per cent. came from a showing several feet wide on the surface, and there are similar showings in various places. It is scarcely credible that, except in one place where a short hole was fired to disclose a bunch of malachite, and one place where a few pieces of rock has been picked off, no work of any kind has been done. Lower down at A on plan a cut was put in near the dry river bed. The surface rock is considerably decomposed and leached in places, and it was impossible to take average samples over a given width that would have given any useful information. It was impossible in the time at my disposal to even fully explore the full extent of the mineralised area, especially towards the summit of Tatasberg, where the ridge rises at least another 600 feet. The features which impressed me most favourably were:

(1) Regular mineralization alongside and apparently also in intrusive dykes and alongside large and persistent quartz lodes.

(2) This mineralization, despite leaching action, showed in several places payable copper ore.

(3) The mine realization extends over large widths and indicates the presence of large ore bodies.

(4) The quartz lodes on the top of the hills also show evidence that they may, as at Fennings Mine, carry copper ore below their bleaching outcrop.

(5) Excellent facilities exist for working to a great depth by adits and open quarries, and the Orange River as shown in the photo is quite close.

I can scarcely expect to see a rich mine developed, rather one in which the bulk of the ore might need concentration. The presence in cut A shown in plan of grey copper ore assaying from 40 to 50 per cent. copper up to one inch thick and the assay of 15·4 per cent. on surface shows however that rich ore in a certain proportion will not be absent. Regarding the probable tonnage that will be available, I have not sufficient data to make an exact estimate, but I should at least expect to develop several hundred thousand tons for each hundred feet in depth. After making every allowance for the present difficulties regarding communications I have no hesitation in stating that such an occurrence deserves opening up. The hillside is steep and three adits about 100 feet long will give a good idea of the value and character of the deposit in the sulphide zone. Numerous surface cuts are also required along the course of the dyke.

To the shareholders of the Solomon Syndicate and those investing money to further develop this district, I can only say that I advised my principal not to send me to Namaqualand as I expected only to see small and insignificant ore occurrences. I am, however, now so pleased with the general prospects of the district that, should circumstances allow, I should be pleased should capital be raised to assist for a few months in organising and directing the early stages of development work if required. Only four samples were assayed for gold and silver; these all showed traces of gold and up to 3½ ozs. of silver. This gold and silver is always concentrated in the smelted copper and adds appreciably to its value.

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A REVIEW OF THE SOUTH AFRICAN MINING AND ENGINEERING TRADE.—III.

What Happened in the War Period—Possibilities of the Market for British Goods—American Competition.

The following is the continuation of Mr. J. Wilson Goode's report on South African trade conditions:—

Electrical Machinery.—Although the price of every class of electrical machinery rose beyond all expectations, the value of the imports in 1918 was only £126,323 as compared with £451,280 in 1913, so that the actual quantity imported during 1918 was probably under 20 per cent. of the imports in 1913. The position of the United Kingdom was stronger in comparison in 1918 than in 1913, but it must be taken into consideration that whereas in 1913 the imports from Germany were valued at £252,746 the imports in 1918 had discontinued. The imports from America in 1918 represented about half the total, whereas in 1913 they did not amount to 10 per cent. of the total. In many cases orders for electrical machinery were suspended during the period of the War, and a demand from the United Kingdom can be looked for with confidence. As to the probable position of United Kingdom manufactures in the near future, it is thought that every effort will be made by German manufacturers to export to this market either direct or through the medium of neutral countries.

Electrical Materials: Cable and Wire. The total value of the imports in 1913 was £250,669 as compared with £90,624 in 1918. Whilst the imports from the United Kingdom decreased in value from £170,293 in 1913 to £19,744 in 1918, the American imports increased from £4,977 in 1913 to £32,026 in 1918. The most striking feature in connection with the imports of these articles is the extraordinary position of Japanese imports in 1918. During that year the value of Japanese imports was £33,955, which amount is greater than that of any other country, yet it was not until 1917 that Japanese manufacturers introduced their goods into this market, when the value of such imports amounted to only £142. In view of the inferior quality of the Japanese supplies and the impossibility of relying upon goods being equal to sample, it is not thought likely that Japan will retain any hold on this market when other countries are free to supply the necessary requirements.

Electric Fittings, including Posts.—In point of value the imports in 1918 were greater than in 1913, the figures being £282,093 and £263,768, respectively, but, having regard to the enormous increase in value of these articles, the quantity imported in 1918 was considerably less than in the comparative year. The value of the imports from the United Kingdom in 1918 was £82,543, as compared with £154,775 in 1913. The imports from the United States of America in 1918 were valued at £79,233, as compared with £29,578 in 1913. The imports from Japan showed a steady increase until 1918, when they rose in value from £6,052 in the previous year to £24,327. The observations in connection with the prospects of Japanese competition in cable and wire hold true in respect of electrical fittings. The value of the imports from Holland, which in 1913 were £2,901, rose to £24,042 in 1917, and to £94,515 in 1918. The position during the last few years points to the conclusion that there will be keen competition for the trade which was

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formerly in the hands of Germany, and it is believed that the United States of America will succeed in capturing a large share of it.

Railway Material (Government).—The difficulty of obtaining the necessary supplies of railway material during the War, owing to the inability of British manufacturers to execute orders, has largely depreciated the rolling stock of the South African Railways. During the War the services have been curtailed, partly through shortage of rolling stock and partly through the reduction in the number of employees owing to military demands. It is believed that after the lapse of a reasonable period from the date of the cessation of hostilities, the channels through which supplies were drawn before the War will be reverted to. Only a very small proportion of the Government railway stores are obtained from sources outside the United Kingdom.

Railway Material (Private Account).—In addition to the requirements of the Government for railway supplies, the mines are very large importers of railway material, including light rails, locomotives, etc. The following particulars relating to railway material are in connection with the mines and with the railways other than the Government railways.

Rails.—The total quantity of rails (light and other) imported in 1913 was valued at £79,271, of which £61,375 represented the value of the imports from Germany. The imports from the United Kingdom were valued at £13,390 and from the United States £2,555. During 1918 the imports were valued at only £16,033, of which the United States of America contributed £10,218 and the United Kingdom £4,397. No supplies were drawn from any other countries, although up to the year 1917 a certain quantity had been imported from Canada.

Sleepers.—During 1913 the value of imported sleepers was £6,656, of which Germany contributed £3,320, the United Kingdom £1,895 and Australia £1,266. During the year 1918 the total importations only amounted to £615, of which the importation of sleepers from Madagascar was valued at £451 and from the United Kingdom at £126.

(To be continued.)

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THE WEEK IN THE SHAREMARKET.

Gold Shares Firm and Active in View of Coming Dividend Declarations—Diamond Syndicates Less Buoyant—Frank Smiths Rise—Crown Diamonds Fluctuate.

THE week has been a busy one in the sharemarket. In view of the better dividend declarations foreshadowed by the Consolidated Main Reef declaration, all gold shares have been higher and more active; and it certainly looks as if we were to have an excellent Christmas market. Led by New Modders, all the Far East Rand stocks have been in great demand; the steady upward tendency is shown by a glance at the quotations below. Diamond shares have also been an active market, but by Thursday there seemed to be a disposition to tire of the too prolific crop of new syndicates that have come on the market. Crown Diamonds fluctuated erratically and fell sharply on Thursday. Frank Smiths seem to have at last begun to move, and are, it is said, quoted much higher in London. Victories and Percys were popular and active counters, the former being of shilling and the latter of half-crown denominations. Oils were largely dealt in during the week, and seem to be held in high esteem. S.A. Alkalis continue to fluctuate. Coal shares are a firm market, and the new silver-lead flotation bids fair to become a popular investment. With the rising prices for silver and lead, the flotation promises to afford its fortunate participants plenty of scope for excitement.

	Fri., 28th.	Sat., 29th.	Mon., 1st.	Tues., 2nd.	Wed., 3rd.	Thurs., 4th.
African Europ. Inv.	20 0†	20 0†	20 0†	—	—	17 6*
African Farms . . .	16 6	16 0*	17 6	17 4½	16 9	17 6
Anglo-Amer. Corp...	62 9	62 0	61 3*	60 0	58 0*	60 0
Apex Mines	7 6*	—	7 6*	8 0†	7 6*	8 0†
Bantjes Cons.	3 3*	3 4	3 3*	3 4	3 3*	3 5
Blaauwbosch Dia. .	90 0†	90 0†	—	—	—	—
Brakpan Mines . . .	70 0	69 0*	70 0*	67 6*	70 0†	70 0
Breyten Collieries .	9 0*	—	9 0*	9 9*	9 6*	9 0*
Brick and Potteries	4 6*	—	4 6*	4 6*	—	4 6*
British South Africa	24 0*	24 0*	—	24 0*	24 0*	—
Bushveld Tins . . .	2 8	2 8	2 7	2 9	2 11	2 11
Cinderella Cons. . .	6 0*	6 0*	6 3†	6 3†	6 0*	6 6*
City and Suburbans	8 0	8 0*	8 0	8 3	8 0	8 0
City Deeps	64 9	65 0	64 0*	65 0†	64 0	62 6*
Clydesdale Collieries	29 0*	30 0†		28 0*	28 9	28 3*
Con. Investments . .	34 6†	—	—	—	—	—
Con. Langlaagtes . .	22 0*	22 6*	22 0*	22 0*	22 0*	—
Con. Main Reefs . .	12 9	12 10*	12 9	12 9	12 9	13 0
Con. Mines Selec. .	30 0*	32 3	32 0	33 0*	35 0	35 6
Coronation Frees. . .	2 7*	2 6*	2 7	2 6*	2 6	2 6
Coronation Synd. . .		10 0*		10 0*	—	—
Crown Diamonds . .	14 10½	14 10½	15 6	16 6	16 9	16 9
Crown Mines	68 0	70 0†	67 6*	68 6*	68 0*	68 0*
Daggafontein Mines	21 9*	22 9	22 9	22 3*	22 6*	22 3
Do. Options, 4 yrs	3 3*	3 6	3 3	3 4½	3 6	3 6
Durb. Roode. Deeps	9 0†	9 0†	9 0†	—	—	8 9†
East Rand Coals . .	2 9	2 8*	2 9	2 9*	3 0†	2 9†
East Rand Deeps .	1 2	1 1*	1 1*	1 1*	1 1*	—
E.R. Minings	—		26 0†	—	26 0†	—
East Rand Props. .	10 0	10 0	10 4½	11 7½	12 3	12 10½
East Rand Deben. .	£67½*	£67½*	£67½*	£67½*	—	£67½*
Eastern Golds . . .	1 9*	2 0†	1 10	1 9*	2 0†	1 11*
Ferreira Deeps . . .	9 0*	10 0	10 9		11 0	11 0
Frank Smith Dia. . .	8 4½	8 7	9 3	9 2	9 4	10 8
Geduld Props. . . .	60 6	60 0*	60 6*	60 9	60 9*	61 3
General Minings . .	—		8 6*	9 0*	8 6*	
Glencairns	1 0*	—	—	—	—	—
Glencoe Collieries .	5 3*	6 0		6 0*	5 9*	
Glynn's Lydenburgs	16 6*	17 0	17 0	17 0*	17 6*	18 0
Government Areas .	100 0	101 0	101 0*	102 6*	102 6	103 0
Hume Pipes	22 6	22 0A	22 3	21 3	21 3*	22 3*
J'burg Board of Ex.	—				32 6*	33 0*
Jupiters	4 9*	5 0*	5 3	5 9	5 9	5 6
Klerksdorp Props.	2 0*	2 0*	2 0	—	2 0*	2 0*
Knight Centrals .	6 9	7 2	7 6	7 9	7 7	7 1
Knights Deep . . .	8 6*	10 0†	8 9*	9 0*	9 0*	—
Lace Props	21 9	21 9	21 6	21 7½	21 9	21 9
Leeuwpoort Tins . .	33 0	34 0	33 9	33 9	33 3	32 6
Lydenburg Farms . .	9 1*	9 1*	9 3	9 1	9 1*	9 2*
Meyer and Charl.	92 6*	95 0*	96 6*	—	95 0*	—
Middelvlei Est. . .	2 3*	2 6†	2 6†	2 5†	2 1*	2 3
Modder B.'s . . .	185 6	185 0	182 6	180 0	182 0	183 0
Modder Deeps . .	53 6	53 6	54 0	55 0	55 0	56 0
Modder Easts . . .	31 3	31 10½	31 9	31 9	32 3	32 7½
Do. Options, 3 yrs	12 6	12 4½	12 4½	12 3*	12 9	13 0*
Do. Options, 4 yrs	14 0*	14 6	14 6	14 7½	14 7½	15 6†
Natal Navig. Coll	27 0*	—	—	—	—	—
National Banks .	—	£11½†	—	£13†	£13†	—
New Boksburgs	1 10*	2 0*	2 3	2 3*	2 4	—
Eew Eland Dia.	87 6*	87 6*	85 6*	86 0*	87 6	88 9
New Era Cons	12 6	12 4*	12 6	12 6	12 6	12 3*

	Fri., 28th.	Sat., 29th.	Mon., 1st.	Tues., 2nd.	Wed., 3rd.	Thurs., 4th.
New Geduld Deeps .	2 3	2 3	2 4	2 3*	2 3*	2 3*
New Heriots		9 6*	9 0*	10 0†	-	10 0†
New Kleinfonteins .	12 9	12 9	12 6	12 9	13 0	13 3
New Modders	£32¼A	£32¼A	£32	£32⅜	£32½A	£32⅛*
New State Areas . .	33 0	32 6*	32 9	32 6*	32 6	32 6*
New Unifieds	5 9†	5 9†	5 9†	5 6*	5 3*	—
Nigels	7 0*	7 9†	—		—	—
Nourse Mines	15 0†	16 0†	—	16 0†	—	14 6†
New Stock 4½ p.c.	£102*	£102*	£102*	£102*	£102¼*	£102½*
New Stock 5 p.c. .	£101†	£101*	—	£101½*	£102*	£104*
Pretoria Cements . .	98 0	99 0	99 0*	99 0	98 6	98 6
Princess Estates . .	3 4*	3 4½	3 3*	3 3*	3 0*	3 5†
Rand Collieries . . .	3 6*	3 6*	3 6*	3 6*	3 6*	3 0*
Rand Mines	—	—	—	70 0*	—	—
and Nucleus . . .	2 1*	2 1*	2 1	2 3†	2 1	2 0
Rand Select. Corp..	110 0	108 9	107 6	110 0*	112 6	110 0*
Randfontein Deeps .	6 10*	—	—	6 9	6 11	6 6*
Randfontein Estates	25 3*	25 0*	24 9*	24 9*	24 9	24 9
Roberts Victors . .	20 6	20 0*	21 0	23 3	26 6	24 0
Rooibergs	8 3	8 4½	9 0	9 6	10 0	10 6
Rouxvilles	26 0*	25 6	27 0	26 9	26 6	27 0*
Roodepoort Uniteds.	3 6*	4 0*	—	4 0*	—	3 9*
Ryan Nigels	3 9*	4 0*	3 9*	3 9*	4 2*	—
Shebas		2 3	-	2 0*	—	2 0†
Simmer and Jacks .	-	—	—	—	5 6*	5 6*
Simmer Deeps . . .	3 0†	—	2 6	2 6*	2 6*	2 6*
S.A. Breweries . . .	39 0*	42 0A	44 0*	45 0*	47 6*	47 6*
S.A. Lands	6 9	6 8	6 9	6 9	6 11	7 1
South Van Ryns . .	8 9	8 9	9 0	8 9*	8 9*	8 10*
S.A. Alkalis	48 0	46 0A	47 0*	45 0	42 6	42 6
Springs Mines	54 9	55 9	55 9	55 3	55 0	56 9
Sub Nigels	20 3*	20 9	20 6*	20 3*	20 9	20 10½
Swaziland Tins . . .	16 6†	—	—	—	17 0†	—
Transvaal Lands . .	30 0†	30 0†	30 0†	—	30 0†	—
Tudors	1 3*	—	1 6*	1 6*	1 6*	1 6*
Tweefontein Cols. .	26 0*	—	26 0*	26 0*	-	—
Trans. G.M. Est. .	—	16 0*	15 0*	15 0*	—	14 9*
Union 5 per cent. . .	£103	£103⅛	£103*	£103½	£103¼	£103⅛*
Van Ryn Deeps . . .	93 6*	95 0*	96 6	96 6	96 0*	97 0*
Van Dyks	—	3 6*	3 9	3 6*	3 6*	3 9
Village Deeps	14 *0	16 0	16 0*	16 0*	16 6	15 0
Village Main Reefs .	8 6†	—	—	—	8 6†	9 0†
Victory Monarchs .	—	30 0*	36 6†	30 0*	34 0†	30 0*
West Rand Cons . .	7 6†	—	—	-	—	—
Western Rand Est..	10 9	11 6	12 0	11 6	11 6	10 6
Witbank Collieries	—	—	75 0*	82 6*	—	-
Witwatersrands . . .	17 6*	18 0*	—	19 3*	19 6	—
Wit. Deeps	9 3	9 3	9 6	9 6	10 0	9 6*
Wolhuters	3 9	3 9	3 3	3 9	3 11*	4 2
West Springs . .	26 9	26 7½	26 6	26 3	26 3	26 3
Options	10 0	10 0	10 0	10 0	9 6*	9 6*
Zaaiplaats	11 9	11 10	12 1	11 9	11 6*	11 3

*Buyers. †Sellers. AOdd lots. §Ex London.

The Consolidated Goldfields of South Africa Co. have purchased the Grahamstown Brick and Tile Company, which possesses deposits of high-class clay suitable for pottery. It is the intention of the Goldfields Company extensively to develop the industry in bricks, tiles, drain-pipes and pottery.

Messrs. Samuel Montagu & Co., referring to the rise in silver in their weekly bullion circular, state that private individuals have commenced to overhaul their stock of unmanufactured silver goods with a view to realising the metal in the case of bulky, inartistic articles which possess no sentimental value.

In the course of a further instalment of an exhaustive report on "Inorganic Chemical Industries," by Prof. M. Rindl, of Grey University College, which is being published in the *Journal of Industries*, the author remarks: The brine of the Matsap pan in the Hay district contains a small amount of potassium nitrate, and this source of nitrate has, as far as the writer is aware, not received serious consideration.

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TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Business Fair for Outside Orders—American Business Almost at a Standstill—Oversea Notes—Electrical Goods—Iron and Steel—Building Material—Oils and Colours.

According to a mining material broker, business is quite fair, more particularly in connection with outside orders as apart from the mines; further, it was remarked that if material was greater and more assorted business would be better, as inquiries had been greater than for some months past, but that does not say that transactions had been more abundant. The mining material business is being cut so fine that brokers are finding it difficult for their turnover to show a decent margin of profit. The brokers complain that in consequence of the dearth of mining business merchants are much inclined to telephone one to another and so pass the broker over. The American business is almost at a standstill, as it is a rare thing for the importers to give a straight-out price, therefore any orders or inquiries made have to be confirmed in New York. There are three or four boats on the way from New York with wire, galvanised iron, and general merchandise; they are expected to arrive at the coast very shortly. The difficulty of trading with America is on account of the unsettled state of the labour market, and the coal strike is still very much in evidence. Quotations are ruling very high for iron and steel and mining material generally, and a cable received this week shows a further advance of 20, 30 and 40 per cent. on previous quotations. There is some talk on the Exchange that a large quantity of solid drill steel having been received since the Armistice is not according to size, and the consignees are in somewhat of a quandary as to what is best to be done with it. It is not surprising that during the War a few mistakes were made; it would be strange if it were otherwise. A cable was also received stating that the actual exchange value of a sovereign was 3 dollars 98 cents. The difficulty of getting goods from America and the low rate of exchange should be good for the English manufacturers if they will only hurry up and send their goods along, even at the present high rates now ruling.

A Christmas Par.

As we are in the Christmas season, it may be just as well to go a little outside the usual run of these notes. The retail shops have begun to put on a decidedly Christmas appearance, more particularly with toys. There is not a superabundance of toys, but with the assistance of the Johannesburg manufactories there will be ample to go round. The feature is that there are no improvised toy shops for the Christmas trade as is customary; it may be that empty shops are not available, or that the wholesale price of toys to be sold has gone too high to allow of several profits. One of the great emporiums regrets to announce that owing to the enormous expansion of their many departments they have found it impossible to devote the necessary space to this particular Christmas trade, as they intended instead to devote attention to the show of useful presents, and so forth. Another merchant also stated that he relinquished the toy trade several seasons back for want of room and the inconvenience created when his stuff was exceptionally busy.

Interesting Oversea Notes.

In the steel trade most of the trade is centred in rolling steel rails largely for Home use, but the demand is easier. It was feared that in all classes of steel there would be great competition from America, but that country is so very full up with trouble that the British steel makers who were dreading imports at low rates need not fear for the present. Rails of heavy sections are £17 per ton, with light rails at £19 to £21. Nothing is doing in ship-plates or boiler plates, since Government contracts were suddenly stopped. Throughout the country work on Admiralty contracts has largely come to an end. Shipbuilders are giving increased attention to merchant work. In the Midlands there is less unemployment. In the iron and steel trade prices have not changed materially, the exception being galvanised sheets, which trade has been marked by a revival. Supplies of pig iron which has been restricted, show signs of improvement. Makers of finished iron are well placed for orders, and for various grades of small iron the demand exceeds the supply. The edge tool makers have good business and the steel trade is generally more active. On the whole, foreign competition is not quite so pronounced. Trade in Sheffield is both very good and very bad. The call for some important Sheffield products is miserably poor. For others it is inconveniently heavy. It is difficult to obtain foreign orders for the best classes of tool steel, and there is little sign of a revival of the once valuable American purchases. The heavy forges which produce material for the engineering works have also been extremely quiet since the Armistice. Things also continue sluggish in engineers' small tools. Firms specialising in the large twist-drills made of high-speed steel are wanting business, whereas the demand for small carbon drills is so great that difficulty is experienced in obtaining them. These come mainly from the United States. The activity of the file trade is phenomenal; all the factories are in arrears with orders and there would be plenty of work for additional ones. There is a big oversea demand and vast quantities are wanted at Home. The pre-War competition among makers no longer exists. These are acting in concert with regard to prices and discounts, and the state of the supply and demand enables them to get the figures agreed upon.

Electrical Goods.

Tubing and wiring are being received in fair quantities, but the fears of a shortage in both after the arrival of consignments already advised as on the water are more than confirmed, as the difficulties in the matter of raw material on the other side are becoming more and more accentuated. As a matter of fact electrical materials are much dearer at Home than they were six months ago. A prominent dealer showed us a cable stating that screw tubing was very scarce indeed and prices simply ridiculous, and practically more than 100 per cent. since the Armistice was signed. Ordinary tubing has advanced in the same period from 8s. 6d. to 16s. The screw tubing mentioned in the cable, which is employed in concrete buildings, has practically doubled in price during the last twelve months. A dealer mentioned that he had just received a small consignment of this from Germany, manufactured in pre-War days, at a fairly reasonable price, but he stated that prices to-day for any goods received from either Germany or Austria would probably far exceed those ruling in England. Our informant said he was constantly being asked for a Vienna-made lamp from an exceptionally fine factory producing an excellent lamp, which was much in demand both here and in Australia, which country he had visited two years ago.

To-day, of course, these lamps were unobtainable owing to the absence of raw material. Town and country business continues very satisfactory notwithstanding insufficient stocks, but people outside the Transvaal, he said, do not seem to realise the exact position here regarding materials, and seem to imply in their letters ordering stocks that profiteering must enter into the business. Ceiling roses are still practically unprocurable, the nominal price being 10s. 6d. to 11s., while in England the quotation is about 6s. 9d. a dozen; however, large orders have been made and consignments are shortly expected. The general tendency in the electrical material business is for prices to harden; lamps, which have been fairly stationary for weeks, are expected to feel the first effects of the general firming up.

IRON AND STEEL.

The Dunswart Company state that their mills are now rolling down to ⅜ in. rounds and squares and down to ⅝ in. by ¼ in. for small flats, but these smaller sizes are scarce at present as the new mill is not yet running at full capacity. Imported mild steel is 32s. 6d. to 40s. for the smaller rounds, as they are getting scarce. Bar iron is 35s. for small sizes and 32s. 6d. for the larger sizes. Barbed wire of 400 yards, light gauge, 32s. 6d.; and 98 lbs., 12 gauge, 37s. 6d. Fencing wire, 37s. 6d., 8 gauge. Drill steed, 7½d., and tool steel, 1s. 3d. per lb. Brass rods and plates, 2s. 6d. per lb. Picks are very scarce in consequence of the demand for the returned soldiers when going to the diamond fields. The price paid is from about 70s. to 72s. 6d. per dozen. Shovels are in plenty at 60s. to 65s. per dozen; wheelbarrows, 52s. 6d.; wire nails, from 35s. to 45s. per 100 lbs., from 2 to 6 in. The commercial brokers say that their business is restricted to buying and selling amongst local merchants, perhaps not so much on account of the high values as because of the anticipated difficulty of obtaining the material from Britain, Canada and America.

TIMBER AND BUILDING MATERIAL.

In consequence of several consignments of deals having arrived from the coast prices are not exactly easier, but for a time they have been checked on the up-grade. Deals are now 1s. 8d. to 1s. 9d. and 2s. for the extra good, say, 20 feet lengths; floorings, 9d. to 9½d.; ceilings, 6½d.; and galvanised iron, 24-gauge, 1s. 7d. per foot. It is expected that Baltic timber will be more and more difficult to obtain because of the increased demand from Britain and the Continent, therefore our South African timber dealers should cultivate the Johannesburg market, as the demand is likely to be greater. For example, the company connected with the Parkview Estate has arranged to build a number of houses and a limit will only be reached when they are not readily saleable. Something like a batch of thirty will be built in and about Kildare Avenue. There is a big block of flats going up just to the north of the new university site, and another lot nearly opposite the Zoo; then there is the university, as well as two new bioscopes in town, and a big firm has just purchased the half block of stands for a big building in Pritchard Street adjacent to the Catholic Church in Kerk Street. One could extend this list, but this is sufficient to show that Johannesburg is in the midst of a good building activity, so much so that contractors are practically declining new contracts until after Christmas. One particular reason is that bricks for new contracts cannot be obtained under three months; in fact a small order of only 20,000 cannot be had this side of Christmas, and the cost is not the only consideration. For ordinary stock bricks the nominal quotation is from 60s. to 70s. per 1,000 delivered in Johannesburg without any guarantee of time. The contractor for the Parkview houses will make a start to manufacture his own bricks, carting them with motor trolleys.

OILS AND COLOURS.

According to a December trade circular, it appears that white lead in oil is 95s. for 100lb. kegs and 1s. 3d. per lb. for smaller sizes. Ordinary white lead has advanced in England £5 per ton, but is still sold in Johannesburg at 95s. per 100 lbs. Linseed oil has fluctuated considerably during the last month; present local price is 105s. for raw and 115s. for boiled of two 4's. Turps remain very firm; there seems to be no hope of any decline until the new crop comes in—110s. to 115s. for two 4's, and 125s. for ten 1's. Turps substitute 60s. a case of ten 1's. English putty 9d. a lb. in bladders and 7½d. a lb. in bulk. Plate and window glass is acutely scarce and no large orders are being taken. Nominal quotations are 1s. 4d.; plate 7s., and window 1s. 6d. for 16oz. and 2s. to 2s. 6d. for 21oz. No news of new stocks coming forward, but hopes are entertained that we shall hear news by the incoming mail.

Wallpapers.—New pattern books cannot be issued until about February 1st. Ample supplies of wallpapers for the Xmas trade are expected.

THE WAY OF THINGS.

The Union Castle Co. has an official programme of shipping from England up to end of year, viz., November 28th, December 12th, 19th, 24th and 31st, and the return journey to England is also weekly. No reduction of fares is expected for a long time as coal is £5½ per ton in England, and wages are up considerably for the officers and men on the ships. Only single tickets are issued with a reduction of 10 per cent. on the single journey back. First class fares per mail are from £72 to £59; intermediate £59 to '51, according to the position of the various cabins. Second class single per mail £41 to £45, and intermediate £38 to £42 from Cape to Southampton.

The Johannesburg Profiteering Committee had their first meeting on Wednesday afternoon, when the preliminaries were arranged. The committee has an excellent show of names, although maybe on the amateurish side. It will be very interesting to follow the proceedings without prejudice, if that is not expecting too much. In this respect a visit to the municipal produce market was interesting for the purpose of purchasing forage, and notwithstanding the drought having been broken for a fortnight, prices are ruling very high indeed. Almost one might say that there is not yet any material difference in the quotation for the best forage and cattle footstuffs, which is a great proof that the drought entered into the very vitals of the agriculturists. According to Reuter, a sharp drop of 15 to 20 per cent. in the auction price of wool occurred at East London on Wednesday afternoon. The decline is attributed to the reduction in Japanese buying, as recently high-priced wools have practically all been sent to Japan. One thing the Profiteering Committee can do is to enquire why the Capetown millers will not quote for flour to be sent away from that Province, as the Rand has been a wonderfully good customer, and surely a pro rata distribution might be expected. Until the next week's crop comes in from the Transvaal and Free State it seems that we shall have to depend upon Australia for our chief supplies. That would be all right providing the shipping were available, and here is a case where our Government could assist , or, to put it more strongly, must, assist with their own ships or influence.

CROWN MINES, LIMITED.

(Incorporated in the Transvaal.)

NOTICE TO THE HOLDERS OF OUTSTANDING FIVE PER CENT. FIRST MORTGAGE DEBENTURES OF THE ISSUE OF £1,000,000.

Whereas the Company has purchased the requisite number of Debentures to cover the sixth annual drawing of £85,000, due to take place in November, 1919, for payment on 1st January, 1920, notice is hereby given that the Debentures so purchased will, in accordance with the provisions of the Debenture Trust Deed, dated 31st August, 1912, and the conditions endorsed upon the said Debentures, be treated as a satisfaction of the obligation of the Company to make a drawing of Debentures for payment on the 1st day of January, 1920, and no drawing will, therefore, take place.

By order of the Board.

RAND MINES, LIMITED, Secretaries.
S. C. STEIL, Secretary.

Head Office: The Corner House,
Johannesburg, Transvaal.
29th November, 1919.
47423

ENGINEERING SECTION.

THE SOUTH AFRICAN RUBBER MANUFACTURING COMPANY—AN AUSPICIOUS OPENING.

THE age-old village of Howick, which is situated about 14 miles to the north of Maritzburg, Natal, was roused from its usual placidity on the afternoon of the 27th November by the assembling of a crowd of several hundreds of visitors to witness the laying of the foundation stone of the Rubber Company's new factory by his Honour the Administrator of Natal, Mr. G. T. Plowman. Notwithstanding the heavy rain which commenced to fall as the public assembled, the Administrator proceeded to the waiting foundation stone, which, reposing under a flagstaff bearing a Union Jack, was suitably inscribed. Mr. William Eales, resident director, opened the proceedings by requesting His Honour to lay the stone, at the same time presenting him with a handsome silver trowel. Before laying the stone, Mr. Plowman said: "In the past we have always regarded Howick, with its celebrated waterfall, as one of our beauty spots, as well as a health resort, a place associated with picturesque scenery rather than with industrialism. Like many other places of the kind, Howick was marching with the time, and there seemed no reason why there should not be a combination of rural beauty and commercial activity." Proceeding, His Honour said: "The factory whose foundation stone I am about to lay is an extension of a business established in the Transvaal some years back for the manufacture of India rubber goods for mechanical purposes. It is representative of a policy of the British manufacturers to establish works in the Dominions. The promoters and founders of the present project are Messrs. Geo. Spencer Moulton & Co., of London, and Wood Milne, Ltd., of Manchester, who are known all the world over as makers of motor tyres and tubes, mechanical rubber gear and footwear. These companies are largely interested in the S.A. Rubber Manufacturing Company, Ltd., and the whole of their markets, formerly supplied by goods made in England, will be dealt with from this factory. Not only will the Howick mills supply South Africa, but it is hoped that at an early date the South African company will be able to export and supply the allied companies' requirements for their markets in the east and the Argentine. The works, covering roughly 50,000 square feet, the foundations of which you can now see laid out, represent the most modern ideas in rubber manufacture, and will contain the most up-to-date machinery for the manufacture of rubber tyres and tubes, hose of all kinds, conveyor beltings, vacuum brake and railway gear, footwear (both rubber and composition as a substitute for leather), sugar mill, municipal and mining fittings. The working staff at the commencement will number about 200, with a wages bill of approximately £32,000 per annum, while the output on the basis of a single shift will be in the region of £200,000 yearly. The buildings will be fireproof, and special attention has been paid, in designing, to the comfort of the workpeople. The power plant is entirely hydro-electric, and consists of an intake and sluice gate, at the head of the Falls, a 600 ft. tunnel, to which is connected a 34 in. steel pipe, at the lower end of which is a three-branch distribution pipe leading to Pelton wheels direct coupled to alternators. The main cables will run underground to the factory switchboard house, and, from that point, connections will be made to individual motors. It is expected that the works will be completed by March next. These particulars will convey to you some idea of the very wide and comprehensive operations which the company has in view. I am desired by the directors of the company to assure the people of Howick and the public generally that there will be no disturbance of the natural beauties of the village or the famous Falls. Neither will the use of a portion of the water affect the Falls. The Water Court of the Union wisely decided that the quantity of water to be taken out of the river above the Falls, and put back 600 feet below them, should be limited to one-half of the minimum normal flow. This minimum now takes place at a time during the year when there are few, if any, visitors. It goes without saying that industries of this kind confer a great benefit not only on the local community, but on the country at large. The success of one undertaking leads to others, and it should be our aim accordingly to extend every support to what promises to be one of the most important of our local manufactures. It only remains for me to say that we wish the enterprise every success." His Honour then formally declared the stone "well and truly laid."

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P. DUNCAN, C.M.G., M.L.A. JAMES R. LEISK, C.M.G.
The Hon. ALBERT OLIFF, ERNEST OPPENHEIMER.
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Company Meetings.

LACE MINES, LTD.

The annual meeting of shareholders in the Lace Proprietary Mines, Ltd., was held in the board room, Consolidated Buildings, Nov. 28. Mr. John Munro presided, and there were also present or represented by proxies, Messrs. G. Imroth, J Dale Lace, P. Richardson, J. H. Crosby, E. M. Hind, E. H. Lamb, D. O'Ryan, G. B. Pascoe, A. Barker, W. Nelson, D R. Christie, E. Molyneux, S. B. Joel, H. Wells, O. F. Brotherton, F. Hall, representing the secretaries, and F. E. Jackson representing the transfer secretaries.

Chairman's Speech.

This is the first occasion on which I have the pleasure of presiding at an annual meeting of this company, which has now become associated with the Barnato group of mines. The report of the directors and the accounts which are before you and copies of which have been issued to shareholders, cover the twelve months to August 31, 1919. Owing to the reduction of the issued capital from £255.000 to £127,500, certain items have been written down as shown in the balance sheet. Expenditure to August 31, 1918, under the headings of "buildings and improvements," "boring operations, Vlakfontein," "options on farms lapsed" and "administration and general expenses," totalling £93,125 15s. 10d., has been entirely written off and property account has been reduced from £159.676 8s. 9d. to £125,302 4s. 7d. This reduction of capital and its subsequent increase has been dealt with by your chairman at the last annual meeting, and is again set out in full in the report and accounts now before you. At the close of our financial year, the issued capital was £255,000, since then a further 127,500 new shares were offered to shareholders under guarantee for a period of two months (which expired on the 4th of this month) at 22s. 6d. per share; of these 28.940 were allotted to shareholders in response to applications received, and 98,560 fell to be taken up by the guarantors, thus making the issued capital today £382,500 in shares of the nominal value of £1 each. This offer to shareholders and the guarantee of the issue were in accordance with the conditions laid down in August, 1918, when your company's capital was reorganised and under which scheme your directors were empowered to increase the capital up to a total of one and a half million pounds sterling. The further shares as detailed in the balance sheet are under option to the guarantors, a portion to the 5th March, 1922, and the balance to 5th March, 1924, at 22s. 6d. and 27s. 6d per share respectively.

An item which has hitherto appeared in the balance sheet under the heading of "Spaarwater No. 154 Mineral Rights (at cost)" is now converted into a holding of 251,994 shares of £1 each in a company formed to take over these rights and known as Spaarwater Gold Mines, Ltd., with a total issued capital at date of £500,000, of which 300,000 shares of £1 each were issued against transfer of the above-mentioned mineral rights, and 200,000 shares taken up at par. Our expenditure on these mineral rights (increased since our last annual meeting by £3,916 14s. 10d.) amounted to £147,624 9s. 8d., at which figure the shareholding now appears in our accounts.

The item "Loan" £20,500 appearing on the debit side of the balance sheet, has been repaid since the close of our financial year, and the large amount of money now in hand is nearly all on deposit at a good rate of interest.

Development Awaited.

We have husbanded our funds until such time as developments in adjoining mines justify the necessary oxpenditure for exploiting the reef, which we hope to find at a reasonable depth in our farm Vlakfontein. This farm, which immediately adjoins Rietfontein No. 14, on which the West Springs, Limited, and Springs Mines are situated, forms the dip of these two mines, and the prospects for this property are certainly encouraging. We shall await with much interest the development, especially on West Springs, which has a direct bearing in regard to the policy to be pursued on Vlakfontein. In adopting this policy we are following the recommendation contained in a report by Professor Lawn during his last visit to this country. He is expected in Johannesburg shortly, and your directors will take an early opportunity to again consult him. With regard to the farm Droogefontein, four boreholes put down in 1905 proved the existence of the Van Ryn Reef at the moderate depth of twelve to fifteen hundred feet, but the assay results were not too encouraging. Boreholes, however, are only useful in proving the presence of the reef, and not necessarily a guidance as to the value of the reef, and developments in this district must be awaited before your directors can embark on any policy of exploitation on this farm.

Although the primary object of your comuany is mining, I should mention that your farms, comprising an area of about 9,000 morgen, equal to approximately 18,000 English acres, have a great agricultural value, and are now leased for agricultural purposes at a rental of £2,710 per annum.

I now beg to move the adoption of the report and accounts for the year ended 31st August, 1919.

The report and accounts were adopted.

The appointment of Messrs. John Munro and Gustav Imroth as directors of the company was confirmed, as was the appointment of Sir Abe Bailey, Bart., and Mr. S. B. Joel as directors, in place of Messrs. E. M. Hind and B. Southwall, resigned, while the retiring directors, Sir Abe Bailey and Mr. Julius Jeppe, were reappointed.

Messrs. Page and Fry were re-elected auditors, and the meeting then terminated.

SPAARWATER MINES, LTD.

The first ordinary general meeting of shareholders in the Spaarwater Gold Mines, Ltd., was held Nov. 28 in the board room, Consolidated Buildings. The chairman, Mr. John Munro, presided, and there were also present or represented by proxies Messrs. G. Imroth, J. Dale Lace, P. Richardson, J. H. Crosby, E. M. Hind, E. H. Lamb, D. O'Regan, C. E. Pascoe, D. R. Christie, S. B. Joel, Lace Proprietary Mines, L. Edwards, and F. Hall (representing secretaries) and F. E. Jackson (transfer secretaries).

The Chairman said: This is the first ordinary meeting of your company, the statutory meeting having taken place on 25th April, 1919. The issued capital is £500,000 in shares of £1 each, of which £200,000 is cash supplied for working capital. You will see from the report of your directors and the balance sheet, which are made up to the 31st August, 1919, and copies of which have been circulated to you, that the directors have authority to increase the capital to £1,700,000. A further 200,000 shares guaranteed at par will be issued during January, 1921, making the issued capital £700,000. The balance of 1,000,000 shares are under option to the guarantors of these 200,000 shares and of the 200,000 shares already taken up, the options being in respect of 500,000 shares to Jan. 8, 1923, at par, and an equal number to 8th January, 1925, at 22s. 6d. per share. The property consists of the perpetual undermining rights of three farms comprising Spaarwater No. 154, the combined area of which is 5,718 morgen 572 square roods, or about 11,500 English acres, adjoining the Sub Nigel Mine. The Sub Nigel Company recently struck the reef in the new shaft, which is situate not far from our south-eastern boundary. Where struck, it did not give payable values, but it is well known that, although the whole reef in this district contains some gold, enrichments occur in well defined shoots or zones, and I have no doubt development from this shaft will expose some of these rich shoots. Then, again, work has been restarted on the farm Maraisdrift by the Amalgamated Props. with every confidence of success, and as this farm contains the outcrop of the reef dipping into our property, we await the result with interest. On the advice of Professor Lawn, the board of directors has decided to await developments in this district.

We are to-day in possession of a large sum of money, which is earning interest at good rates, and the policy of your board will be to leave the company's funds on deposit until such time as developments in our immediate vicinity justify the expenditure that will be necessary to explore and open up the reef on your property.

I now beg to move the adoption of the directors' report and the accounts to 31st August, 1919.

Mr. Dale Lace.

In the course of a speech seconding the resolution, Mr. J. Dale Lace said: It is devoutly to be hoped that the time may soon come when a measure of industrial peace may be brought about, satisfactory and agreeable to the labourer, and worthy of his hire, and satisfactory in the same sense to the man who labours most and hardest—the man who has to find the money to pay and who always has to pay, the despised, the grinding capitalist, only grinding in the way that he is the man who has to work the hardest—daytime, overtime, nighttime, and all time, and then generally to reap great fields of abuse. Money no country, no industry can do without; an industry without money and without encouragement must soon languish and die. So it is that labour must have money, money must have labour. Accepting these two facts, and they are indisputable, it is necessary that the factors of which I speak should at the earliest moment come together, each recognising what is due to the other and so getting unitedly to work for the benefit of the whole, for the larger majority, so that money can be foud for labour and labour for money. The saying so frequently quoted that "we are in the melting pot" is particularly true of this industry upon which we are all so dependent. I would like to express the hope that the time may soon come when conditions are so improved in the direction in which I have indicated that those gentlemen with money who to-day hold the options over your shares by reason of the money they have found and have to find may be able to come to us and say, "The options we hold we propose to take up; get on with the development of your No. 2 and your No. 3 farms. The whole world wants your gold; here is the money to find it, and here is the labour."

The report and balance sheet were adopted.

The appointment to the board of Sir Abe Bailey, Bart., and Messrs. S. B. Joel, John Munro, and Gustav Imroth in place respectively of Messrs. E. M. Hind, B. Southwall, L. J. Gau and A. A. Barker, resigned, was confirmed, and Sir Abe Bailey, Bart., and Mr. John Munro were re-elected directors.

The auditors, Messrs. Alex. Aiken and Carter, were re-elected, and the meeting then terminated.

New Companies.

Die Transvaalse Skaap en Bokboere Vereniging, Meintjes Street, Belfast; capital £10.

The Witbank Mineral Water Company, Ltd., Arras Street, Witbank; capital £3,000.

Mahomed Bulbolia, Ltd., Plein Street Rustenburg; capital £500.

The African Congregational Church Company, Ltd., 24 Lower Ross Street, Johannesburg; capital £2 10s.

The Mayfair Tin Manufacturers, Ltd., 11 13 Crown Road, Fordsburg, capital £10,000.

Redgwell Company, Ltd., Fourth Avenue, Geduld Township; capital £1,000.

Elkington Company, Ltd., 68 Van der Walt Street, Pretoria; capital £1,000.

The Pretoria Base Metals, Ltd., 1 Bureau Street, Pretoria; capital £50.

The Good Hope Moving Pictures Company, Ltd., Modder Road, Brakpan; capital £1,250.

Berkman & De Smidt, Ltd., corner of Kerk and Diagonal Streets, Johannesburg; capital £500.

African Farms Products Distributing Company, Ltd., Realty Trust Buildings, corner of Market and Simmonds Streets, Johannesburg; capital £100,000.

Booth & Company, Ltd., 6 Green's Buildings, Commissioner Street, Johannesburg; capital £2,000.

The Maclear Farms Syndicate, Ltd., 97a Commissioner Street, Johannesburg; capital £9,000.

Matzap Nitrates, Ltd., 24 Royal Chambers, Simmonds Street, Johannesburg; capital £7,000.

Du Toit & Deetlefs, Ltd., Kingsway Avenue, Brakpan; capital £4,[illegible].

National Furriers, Ltd., 1st Floor, Heath's Hotel Buildings, Von Brandis Street, Johannesburg; capital £100.

Alliance Oil Company, Ltd., 21 Fraser Street, Johannesburg; capital £25,000.

The Manchester Warehouse, Ltd., 29 Market Avenue, Benoni; capital £5,000.

Mountain Mines, Ltd., 119 and 120 Stock Exchange Buildings, Fox Street, Johannesburg; capital £25,000.

Norman Properties, Ltd., care G. I. Hoffman & Co., Ltd., 36a Loveday Street, Johannesburg; capital £500.

Lomey & Jacobs, Ltd., Cranbourne Avenue, Benoni; capital £15,000.

Vlakfontein Boomplant Maatschappij, Beperkt, office of H. F. Teengs, Smuts Street, Greylingstad; capital £3,600.

Trent Potteries (S.A.), Ltd., 25 Smal Street, Johannesburg; capital £3,000.

Suburban Bottle Stores, Ltd., The Auckland Park Bottle Store, Government Road, Richmond, Johannesburg; capital £100.

Hollansche Apotheek, Beperkt, Market Avenue, Heidelberg; capital £1,500.

Rope Reconstruction Company, Ltd., 4 and 5 Maxwell Buildings, Harrison Street, Johannesburg; capital £500.

Newtown Real Estates, Ltd., 133 Bree Street, Newtown, Johannesburg; capital £300.

African Medicines, Ltd., 58 Loveday Street, Johannesburg; capital £500.

The Castle Gold Research Syndicate, Ltd., 268 Pretorius Street, Pretoria; capital £2,000.

J. F. Standton & Co., Ltd., 12 Southern Life Buildings, Main Street, Johannesburg; capital £5,000.

The Rand Hides Corporation, Ltd., corner of Kerk and Fraser Streets, Johannesburg; capital £1,000.

Hatfield House, Ltd., 18 President Street, Johannesburg; capital £30,000.

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NOTICE.—The postage of this issue of the *S.A. Mining and Engineering Journal* is: South Africa, 1d. All other parts, 1½d.

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The Simmer Deep Strike.

As we go to press there seems no prospect of the egregious strike at the Simmer Deep and Jupiter being settled. It is true, though hardly credible, that the men are striking because an alien who was taken on under a misapprehension has been dismissed to make room for a returned soldier. Organised labour on the Rand must indeed to-day be very cocksure if it can thus flout public feeling and engage in a quarrel wherein, from the outset, it is so palpably in the wrong. Before the trouble proceeds any further we sincerely hope wiser counsels will prevail.

* * * *

S.A. Alkali.

We understand that two of the directors of the S.A. Alkali, namely, Dr. Simmonds and Mr. J. T. Windram, have resigned from the board. Their places will be filled during the next few days.

* * * *

A Sub Nigel Correction.

In the advertisement dealing with the Sub Nigel notice of final instalment of 10s. per share on issue of shares (Nos. 475,001 to 775,000 inclusive), the number of shares should have been 300,000, not 30,000 as stated.

* * * *

T. & D. B. Collieries.

A full report of the important speech from the chair by Mr. S. C. Black at the annual meeting of the Transvaal and Delagoa Bay Investment Co., Ltd., will be found in this issue. The speech reflects the splendid financial position of the company, which is the best proof of its sound and enterprising management.

* * * *

The Modder Meetings.

The annual meetings of the New Modder and the Modder East Companies will be found fully reported in this issue. The feature of the first was the passing of the share splitting scheme. The Modder East meeting evoked a notable announcement regarding the question of milling, which has been decided in accordance with the anticipations expressed in these columns.

* * * *

Solomon Syndicate.

In our last issue there appeared a very interesting report by the well-known mining engineer, Mr. E. M. Weston, on the copper properties secured by the Solomon Syndicate in Namaqualand. Mr. Weston has a reputation as a cautious and conservative engineer; his conclusions, therefore, carry great weight. He says the syndicate has a number of prospects which merit expenditure in their development, and he strongly recommends the adoption of a bold and active policy of exploitation. We hope the Solomon Syndicate will act upon his advice.

* * * *

Our Special Coal Number.

Owing to the labour entailed in the preparation of our Special Coal Number having proved greater than anticipated, and to the compilation of data for maps and statistical tables having taken more time, it has been decided to postpone the issue until after the coming holidays. It may be emphasised that the Special Coal Number will be quite distinct from the ordinary weekly issue. It will run to upwards of 200 pages, illustrations and maps, and will possibly prove one of the most important publications ever issued in South Africa. Through its pages this country's great coal potentialities will be made known to the whole civilised world, as arrangements are being made for copies to be sold in London, Paris, New York, Argentine Republic, Straits Settlements, Egypt, India, and in fact in all parts where coal is of interest. Those wishing for copies can in the meantime send in their orders either to the *S.A. Mining and Engineering Journal*, P.O. Box 963, or to the Central News Agency and all its branches throughout the Union of S.A. and Rhodesia. Price, 2s. 6d. per copy.

De Beers.

The annual general meeting of De Beers will be found reported in this issue, and the balance sheet and annual report appear in our advertising pages. Sir David Harris was able to lay a magnificent report before the shareholders, and he could congratulate all concerned on the success of the policy of regulating supply. His announcement regarding the establishment of a diamond-cutting industry by De Beers at Kimberley will be welcomed throughout South Africa, and the new industry will add another to the long list of enterprises built up by that corporation upon its diamond mining. A striking fact brought out by Sir David Harris is that the Government will receive, on the basis of present prices, a grand total of £3,475,000, which is actually more per annum in direct taxation from the diamond industry than the three principal producers (De Beers, the Premier and Jagersfontein) combined pay annually in dividends on their ordinary shares. In other words, as the chairman pertinently emphasises, the Government takes the cream, and leaves the skimmed milk for the investors. To Sir David's important reference to the coal and other industries of the country we hope to return in our next issue. Meanwhile the chairman, directors and shareholders of the great Kimberley concern are to be congratulated on the year's successful record of achievement.

* * * *

"C.M.S." New Issue.

The directors of the Consolidated Mines Selection Co., Ltd., have offered to shareholders registered on November 10 the 95,000 unissued shares at the price of 30s. per share at the rate of one share for every 12 shares held. Such shares will participate in any dividend declared by the company for the year ending December 31, 1919.

* * * *

New Compound Diamonds, Limited.

The New Compound Diamond Company has just sold a parcel of 45 carats of diamonds for the sum of £250, or, say, £5 11s. per carat, recovered during prospecting operations in the months of October and November. These diamonds are the proceeds of 160 loads washed, representing 28 carats per 100 loads.

* * * *

Transvaal Silvers Over-subscribed.

"All allotments and regrets posted" was the laconic announcement issued recently by Selfridge's regarding their latest share issue, which was largely over-subscribed; and the General Mining people will doubtless follow that excellent example in regard to the Transvaal Silver and Base Metals flotation, which, we understand, has been many times over-subscribed.

* * * *

The Coronation Wilgepoort Deal.

An extraordinary general meeting of the Coronation Syndicate, Ltd., will be held in Johannesburg on January 16 next, for the purpose of confirming an agreement whereby the Coronation Syndicate acquires from the Far East Rand (South) Gold Mine Selections, Limited, the latter company's Wilgepoort property together with certain adjoining claims for 300,000 Coronation Syndicate shares. We have in past issues dealt at length with the Reef conditions existing on Wilgepoort, and with regard to the financial aspect of the scheme readers are referred to a notice appearing in the advt. columns of this journal. It is proposed to increase the capital of the Coronation Syndicate to £520,000.

* * * *

A Lesson for South Africa.

It is announced that the new Australian works of John Lysaght, Ltd., one of the world's great iron and steel enterprises, are expected to be in operation this year. In pursuance of its policy to foster the metallurgical industries of the Commonwealth, the Australian Government is giving every encouragement to the Lysaght development, so that the company will have the benefit of a Federal bonus as well as tariff protection and minimum freights. The Union Government might well follow this excellent example.

Froth Flotation Concentration.

In view of the possibility of oil flotation being used by the new Transvaal Silver Mines, it is noteworthy that important developments of the flotation process controlled by Minerals Separation, Ltd., have been made during recent years. The process, as originally applied, effected the separation of metallic sulphides, graphite and similar substances from waste material or gangue. It depended on the mixture of the crushed ore with water to form a 4 to 1 pulp, to which a small quantity of oil or other frothing agent was added, the whole being then agitated and aerated, when the sulphide minerals rose to the surface entrained in a coherent froth. At first all of the sulphides present were included in the froth, but more recently it has been found possible to separate the sulphides differentially—for example, from an ore containing galena and blende, together with gangue, the galena can be removed as a pure concentrate and then the blende can be recovered, also in a state of purity. Further, it has been found that minerals other than sulphides can also be recovered; for instance, oxidised copper, in the form of copper carbonate, copper silicate, etc., can be concentrated with as great efficiency and economy as the various sulphides of copper. In the application of these developments at the Bwana M'Kubwa mine oxidised copper is being recovered successfully; a variety if reagents may be used, the most useful being the alkaline salts of the fatty acids and similar compounds. It appears that the froth flotation process is capable of still further development.

* * * *

Shamva Economies.

As a partial offset to the increase in the rates of working expenses at the Shamva mine the management were able last year to effect various economies on stores and fittings. Instead of importing pebbles for the tube mills it was found that a certain variety of mine rock was equally efficacious. By using the local material a saving of fully £200 per month was achieved. In describing the alteration the consulting engineer states that the improvement was really greater than the total mentioned, as the mine rock contained gold, which the pebbles did not. Last year was the first occasion upon which this suitable rock was obtainable. A further economy in the mills was the introduction of local hard-wood blocks which are said to have advantageously replaced cast-iron guides for battery stems.

* * * *

The New £3,000,000 Mining Corporation.

The public in London is being invited to subscribe at par for half a million of the £1 shares of the National Mining Corporation, the three million enterprise regarding which we gave particulars in a recent issue. Two-thirds of the total capital has already been applied for by the directors and their associates. The list of directors includes the name of representatives of some of the principal existing mining-finance companies—Central Mining and "Johnnies" being noteworthy omissions—and as the National is apparently to engage in similar business to these companies it is interesting to note the reasons given in the prospectus for the formation of yet another big finance corporation. It is contended that the principle of financial co-operation among the leading mining houses has hitherto not been sufficiently considered and that, with one or two exceptions, the financial resources of any one mining house or group have not been sufficient to undertake the provision of the capital necessary for large mineral industrial enterprises. But there has been financial co-operation at any rate of a sort. If the financial resources have been insufficient, this might, perhaps, be explained by their being locked up in large blocks of shares not readily marketable. The sponsors of the National Mining Corporation are aiming at securing "a dominant position in the industry," and if it is intended to pursue a bold mining policy the management may be able to attain that position. But a bold policy connotes financial risk, and the financing if mining properties in the early stages of development is a risky business. Many may be financed, but few may become valuable mines. However, "Nothing venture, nothing have."

TOPICS OF THE WEEK.

ENGINEERS AND THE COLOUR BAR.

MR. TABERER'S STRAIGHT TALK.

AN extraordinarily interesting discussion has been in progress at recent meetings of the South African Institution of Engineers on the subject of "native labour with regard to the industrial development of South Africa." It may be asked why engineers should choose such a subject for their debates, and the answer, of course, is that the province of the engineer embraces everything that conditions the use and value of all forms of labour. Indeed, the modern definition of engineering is thus written in large letters on the wall of the Engineers' Library in New York: "*Engineering, the art of organizing and directing men and controlling forces and materials of nature for the benefit of the human race.*" Nevertheless, though the right of the engineer to discuss the subject of native labour is indisputable, it is satisfactory to find that the South African Institution has wisely called to its councils leading authorities on the subject from outside. Thus considerable benefit has been derived from the views of such thoughtful observers as Mr. Stallard and Mr. John Taylor, who last month addressed the Institution. This week the members were particularly fortunate in being favoured with the views of Mr. H. M. Taberer, than whom there is, of course, no greater authority on the subject of native labour. Mr. Taberer's views and sympathies are doubtless well known to most of our readers. He has certainly made no secret of them in the past. Only the other day, before the Low Grade Mines Commission, he put them on record with all his accustomed candour and eloquence. And speaking to an audience of technical men on Wednesday night, who have so much to do with the running of the mining industry, he restated the case with such clearness and brevity as to compel conviction. The colour bar must go. That is Mr. Taberer's earnest belief and advice. The native must be allowed to do "skilled" work in the Transvaal, for what is this so-called "skilled" work? Mr. Taberer says the answer is a constantly changing definition fixed from time to time by the demands of the whites, who, owing to their ability to obtain lucrative employment, no matter how incompetent they may be, are continually lowering the standard and bringing into the category of skilled occupations, to the exclusion of natives, every class of work that it suits them to perform, thus constantly lowering on the ladder of employment the rung upon which the colour bar is painted. He proceeds: "And what is the result? We have in industries in the Transvaal a large percentage of European workers whose inefficiency has become a byword, who protected by unjust regulations and "stale custom" can find lucrative employment without any exertion to qualification, and who are thus mere parasites giving no return for the wages they draw. Their inefficiency and lack of ambition detrimentally affect the results obtainable from native workers, and the latter are chafing under a system which not only precludes their employment at classes of work which by education and application they have become thoroughly qualified to perform, but which insists on their being set to work under the supervision of palpably unskilled Europeans, as stated before, many of whom have to be taught their work by the natives whom they are in charge of. Such a system is surely as uneconomical as it is unjust and immoral. Every industry is in the main dependent upon its native labour force for its progress, and its progress is largely dependent upon the efficiency of the native. Yet in the Transvaal we tell him that no matter how efficient he may become, he cannot be employed on certain classes of work since they are reserved for the white man. The result is not only the removal of the greatest incentive to the native to become efficient, but the building up of a useless section of the European population, which because of its fortune to be born with a white skin, is able to draw a very good living wage without any training or effort, and is thus not only in itself unambitious, but is an economic brake in every industry and must be spreading throughout the country the industrial value of a white skin and unfortunately imbuing the coming generation with the same idea." This is pretty plain speaking, but who will dare question its inherent truth? Mr. Taberer is not afraid of the result of the removal of the colour bar. He says: "The fear that natives if afforded the opportunity might oust the white man in the more highly skilled trades and professions can surely only be expressed by those who not only do not know much about the natives of South Africa, but who are also moral cowards because they are unwilling to apply a little grit and effort to the natural advantage of having behind them generations of civilization, and so compete with the greatly restricted capacity of the semi-civilized native. I think I can, without fear of being considered bombastic, assert that I know the native of South Africa very well. I was born and brought up amongst them, and I have laboured all my working days with and amongst them, and, however mistaken my considered opinion may be, it is at all events based on practical experience and knowledge. The capacity of the native of South Africa is very limited despite his enormous imitative propensity. The number of those who can be entrusted with serious responsibility is insignificant, and I have so high an opinion of the white man as to believe that the number of Europeans who would in competition be ousted by natives is just as insignificant. My opinion at all events has this fact to support it—that in other parts of South Africa where the colour bar does not exist the white man has not suffered because of competition with the native. This competition seems to have had the desired effect of stimulating him to preserve to himself a natural monopoly of the professions and skilled trades. I am convinced that the fear that the removal of the colour bar will affect competent European workers, is a bogey. On the other hand we, as rulers and legislators in this country, have a great moral responsibility in our treatment of the native races. But apart from the moral side, we require them and shall always require them at our industries, and for this reason we need to educate them to be useful workers, and it is to say the least of it, cowardly and un-British to say to them so far and no farther can you go in your industrial progress—we are afraid of you and your potential capacity. Remove the colour bar before the native compels you to do so, which he will do before very long." Mr. Taberer is the last man in the world to be an alarmist, and his earnest warning will, we trust, be taken to heart by a larger audience than the engineers to whom it was addressed.

The Future of Tin.

Some timely speculations as to the future course of tin were indulged in by Mr. Oliver Wethered at the Associated Nigerian Tin meeting in mail week. The original estimates of the company's profits at £154,000 per annum were based upon tin at £225 per ton. The price of tin in mail week was £279, which makes a difference of about £37 per ton in the direction of increased profits, but, said Mr. Wethered, "what are the prospects of tin remaining at this figure?" He thinks that everything points to an enhanced price for the metal. In the first place, the undoubted gradual exhaustion of the rich tin deposits in the Straits Settlements will be reinforced by the increased cost of producing the metal in every other part of the world. In fact, the speaker committed himself to the assertion that tin would have touched £300 a few weeks ago but for the steel strike in America. It will be seen from this week's tables that this figure has now been reached.

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TRANSVAAL ARGENTIFEROUS BASE METAL PROPERTIES.

Further Particulars of the Farms Being Floated as the Transvaal Silver and Base Metals, Ltd.

In the course of a lengthy detailed report on the farms of the Transvaal Silver and Base Metals, Ltd., Mr. Oliver King writes: These properties are held on account of their embracing a wide extent of lode-bearing country in which deposits of argentiferous lead, zinc, copper and antimonial ores occur. Much work was done on this belt from 1889 to 1895, principally by the old Transvaal Silver Mines, Ltd., the Witpoortje Syndicate, Ltd., and the White Swan Copper (Argentiferous) Co., Ltd. As far as possible the past records of the properties then worked will be given in the descriptions to follow. The reasons of the closing down of these various enterprises in 1895 were (1) the great fall in the market prices of metals in 1893-94; (2) the excessive costs at that time, especially in transport, the nearest point of railway communication then being in Natal; (3) the heavy inflows of water which have to be dealt with. The ruling conditions to-day entirely alter the position, admitting of greatly reduced working costs and transport charges. With the metal values of to-day, 100 per cent. to 150 per cent. higher than they were in 1895, and the prospect of a long continuance of high prices, together with the possibility of high and economic extraction by the modern methods of oil flotation, the operation of these deposits is placed on a very different footing to that prevailing 25 or more years ago. Before proceeding to detailed accounts of the various holdings I shall give a brief description of the mineral belt. Beyond soft roads there are no serious transport difficulties. The farms are good, and the country cultivated throughout.

The Lodes and their Occurrence.

The belt of shales in which the lodes occur belongs to the Pretoria beds, and is situated geologically between the Despiort and Magaliesberg quartzites, which gentrally form parallel hills on either side of the shale belt. The strike varies from east to west to south-east and north-west, the dips being northwards at gentle angles. A dyke, or more probably a series of dykes, of varying textured diabase, of vertical or very steep dip, courses in the shale beds with parallel strike. The lodes occur in association with this dyke system, either as contact seams, as fissure lodes in the diabase itself, or as branches into the adjoining shale beds. They are often indicated at surface by strong outcrops of ferruginous quartz from which the minerals have been leached by atmospheric agencies. The strike of the lodes is parallel generally with the dyke and shale beds; the dips, if not vertical, being southwards to westwards.

The Minerals Occurrences.

Associated with the lodes, at least over certain areas, are ores of lead, zinc, and copper, generally associated with silver, and sometimes with antimony and bismuth. The mineral occurs in the lodes in banded form, in irregular veinlets or stringers, and again disseminated more or less finely in the gangue. Below the oxidised and greatly altered zone above the water line, which is usually at shallow depth, the associated gangue is largely in the form of iron and calcium carbonates containing manganese. These spathic ores belong to the siderite-ankerite group. Quartz is also associated, together with bands of dyke rock often considerably altered.

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Dear Sir,—Please publish the undermentioned report received from the manager of the Victory Monarch G.M. Co., Ltd.: "Values have improved in the Francis Block to 16 dwts. over 47 inches in north drive in the second level, and to 20 dwts. over 66 inches in No. 1 winze on the first level."—Yours, etc.,

Victory Monarch G.M. Co., Ltd.

H. GOODWIN, Secretary.

Johannesburg, December 8.

Matzap Nitrates.

To the Editor, S.A. Mining and Engineering Journal.

Dear Sir,—In your last Saturday's issue, page 281, you quote a remark of Professor M. Rindl, of Grey University College, Bloemfontein, in regard to the Matsap pan, in the Hay district, Cape Province, to the effect that "the pan contains a small amount of potassium nitrate," but that no serious work has been devoted to its extraction. This is a statement made by him from a Government report 11 years old and refers to a qualitative analysis made at that time from certain precipitant salts. My company, registered during October, has been formed with the object of crystallizing the various salts from the Matsap water, and our manager, Mr. J. C. S. Beynon, and Mr. J. R. Williams, our consulting chemist and metallurgist, have been for some months past residing at Matsap, and work is actively proceeding towards the production of potassium and sodium nitrates, Epsom salts and common salt in [illegible] quantity. The directors of my company are confident that a very profitable industry will shortly be established and that the shareholders will have every reason to congratulate themselves for supporting the venture.—Yours, etc.,

H. MACRAE, Secretary.

Johannesburg, December 8.

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SOUTH-WEST RAND ACTIVITY.

Interesting Developments on the Armistice Syndicate's Claims—A Substantial Tonnage of Payable Ore Exposed.

In our issue of July 26th last we dealt at some length with the revival of a portion of the New Steyn Estate property under the auspices of the Armistice Syndicate. Since then a very considerable amount of work has been achieved by the latter venture, and it will no doubt be of interest to many readers to learn what the present position is at this resuscitated proposition. It may be recalled that some time ago the titles to the western mynpacht of this property lapsed, and this was secured by an enterprise styled the Armistice Syndicate, Ltd., which has a capital of £15,000 in 5s. shares. Of these, 10,000 shares are held in reserve. The working capital was provided at 7s. 6d. per share.

What Past Records Disclose.

The old reports of the directors of the New Steyn Estate Gold Mines, Ltd., show that nearly a quarter of a century ago this company had great hopes of demonstrating the existence of a large and profitable mine on Vlakfontein and Doornkop. A grand total of ore, crushed with a mill of inferior quality, of 5,003 tons yielded 3,908 ozs. 3 dwts., or 15·63 dwts. per ton, but subsequently disappointing results were secured largely on account of the broken nature of the country and lack of knowledge as to the true stratigraphical condition obtaining there. We have already given extracts from old reports, which give a representative idea of the fluctuating fortunes of the New Steyn Estate Company in developing its reef or reefs on Doornkop and Vlakfontein. After these disappointing results the property became idle, but in 1898 Mr. Thorburn bought the Steyn Estate dump for £500. He put up a 5-stamp mill south of the main incline shaft and crushed the dump ore as well as perhaps 100 tons he took from pillars left in the mine. He crushed about 4,000 tons and was still crushing and doing well on the outbreak of the Boer War.

Progress of Diamond Drilling.

Boring is at present proceeding in the extreme western portion of the property. A Sullivan C. drill is employed here. At the time of writing the drill was down to a depth of 188 feet and the crown was in diorite. It is expected that this borehole will intersect at a shallow depth the reef below the big dyke which is a prominent stratigraphical feature in this part of the property. The anticipation is that the reef will be cut at a depth of 350 feet, and as drilling is expected to proceed at the rate of 20 feet a day the Syndicate should not now have long to wait for news as to the conditions existing at some depth in the western area.

Future Drilling Policy.

Apparently the presence of the large fault in this section of the claims was the chief cause of the former owners abandoning ground, and it therefore goes without saying that much will depend on the results secured in the borehole referred to above. Should the present drilling prove successful, it is intended to put down at least two other boreholes to prove the central and eastern sections.

A Promising Area.

The main development is at present proceeding in the eastern area. Here an old shaft has been reopened and has been carried down to a depth of about 140 feet on a promising reef section with a dip of about 25 degrees to the north. A very considerable amount of other prospecting and initial development work has been carried out in this end of the property and as a consequence not less than 500 feet of driving, trenching and costeaning, which have exposed reef of satisfactory value, have been completed. In several sections the assays are of very high value over a fairly substantial thickness of reef and over the whole section in this eastern area the average value computed on a stoping width indicates highly profitable recovery.

Immediately to the west of the Armistice Syndicate's property are the claims held by Mr. Bottomley. This latter proposition is equipped with a small battery, and it is understood that Mr. Bottomley recovered very good values from it until a few years ago, when heavy rains flooded his workings. We understand that it is proposed to employ the ten-stamp mill on Bottomley's claims for the purpose of crushing ore from the Armistice claims. The Armistice Syndicate has a considerable tonnage of ore which could quickly be made available for milling, and the progress of this productive policy at this early stage of development will be watched with very considerable interest. There is evidence of considerable dislocation of strata in this area, but careful development work may result in the reef series being located in their true positions and in the establishment of a more or less permanent mine.

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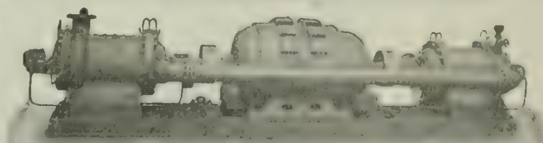

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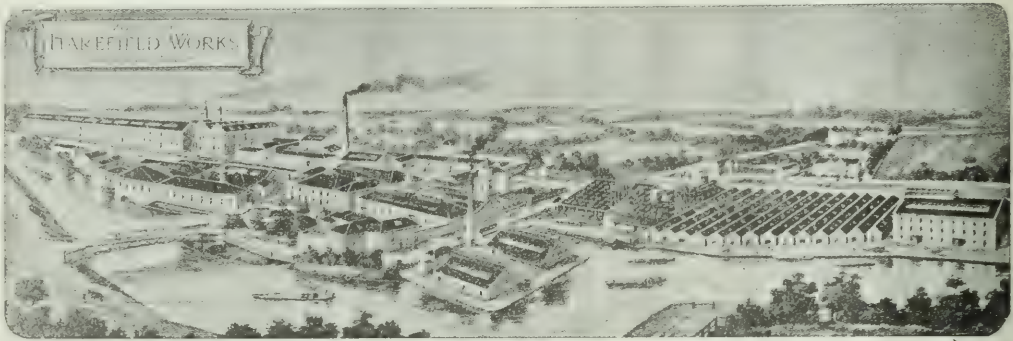

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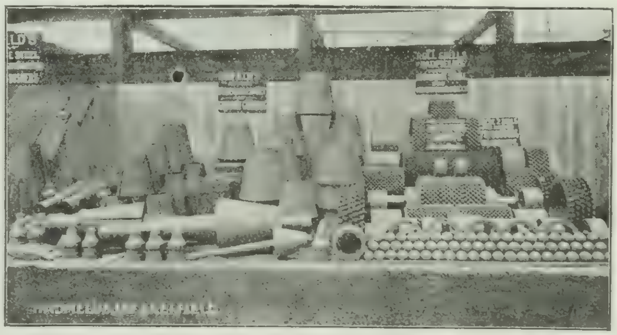

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VENTILATION AT THE WORLD'S DEEPEST MINE.

In the discussion of the report of the committee on working conditions in hot and deep mines, which was presented at the meeting of the Institution of Mining Engineers held at Birmingham last month, Eric Davis gave some particulars of the problem at the Morro Velho gold mine of the St. John del Rey Company, in Brazil. As is well known, this mine is the deepest in the world, the lowest working being 6,400 ft. vertically below the surface and 3,650 ft. below sea level. Luckily the rate of increase of rock temperature with depth is considerably less than that indicated in the report as being usual. Whereas the report gave 1 deg. F. for every 70 ft., at Morro Velho it is only 1 deg. for every 140 ft., although there are indications that the rate is increasing slowly for increased depth, so that for the lowest 2,100 feet the rate has been about 1 deg. for every 119 feet. In the year 1913 Mr. Davis was entrusted by Mr. George Chalmers, the superinendent of the mine, with an investigation into this matter with a view to overcoming the difficulties and rendering the mine workable at depths considerably greater than those which had been reached. The only instruments he had were an aneroid barometer and wet-bulb and dry-bulb thermometers. Readings were taken at every level right down through the mine, and the results were plotted on diagrams having depth in feet for base. It was found that the dry-bulb temperature at any one point in the mine remains practically constant all the year round, but that the wet-bulb temperature undergoes considerable variations. For the same dry-bulb temperature and barometric pressure the wet-bulb temperature depends on the moisture content, and the tests he took and showed that—the conditions being equal, and the mine being a dry one—the moisture content at any point underground, and therefore the wet-bulb temperature at that point, depends almost entirely on the moisture content of the surface air entering the downcast shaft. The whole question therefore boiled down to finding by analogy from the diagrams that volume of the entrance moisture contents which would give wet-bulb temperatures in the working zone below what had been fixed upon as the limiting value, corresponding to the 80 deg. Fahrenheit mentioned in the report. Then the temperature at which the air when saturated with moisture would have this required initial moisture content was that to which the downcast air would have to be reduced before it entered the mine. By hourly hygrometric observation at the surface, extending over a whole year, the worst conditions likely to be reached by the surface air became approximately known. Hence, knowing the volume to be dealt with, the amount of refrigeration necessary, power required, and so on, could be calculated. It was found from the diagram that in order that the wet-bulb temperature in the stopes should not exceed 82 deg., which they had fixed upon as the maximum desirable, the initial moisture content must not be more than about 50 grains per lb. of dry air, corresponding to a saturated condition at 45.5 degs. F. The plant now being erected was mainly manufactured by Messrs. J. and E. Hall, Ltd., of Dartford, was capable of eliminating about 100,000 B.T.U. per minute. This corresponded to the cooling of the volume of air, 80,000 cubic feet per minute, from an initial wet-bulb temperature of 72 degs. (slightly below the maximum actual condition) to 43.5 degs., so that it was on the safe side. As the surface wet-bulb temperatures varied during the year between 75 degs. and freezing point, 32 degs., it is obvious that the refrigerating load on the plant would be a very variable one. To meet these conditions they were dividing the plant into six stages, each complete with its own motor-driven ammonia compressor, condenser and evaporator. The number of those sets running at one time would, of course, depend on the initial temperature conditions. The air cooling would be accomplished indirectly, as it would be deadly to have ammonia mixed with the entering air. Therefore, the ammonia would be used to cool water, which, in its turn, would cool the air as it passed through the Heenan air coolers. The whole plant is on the surface and deals with the downcast air before it enters the mine at all. The mine is absolutely dry, and, therefore, there is no fear of any great amount of moisture being picked up by the air in its course. The plant now being installed will cost about £50,000, and the power required is about 500 h.p. Provision is made for the addition to the original six stages of three further stages in case they should go deeper and still further cooling be required. The ventilation is effected by means of exhaust fans.

Fuel Economy.

A further report has been prepared for submission to the executive council of the Federation of British Industries, setting out the following as the aims and functions of the proposed Fuel Efficiency Committee:—Aims and functions: To conserve fuel by increasing manufacturing efficiency; to help develop and maintain efficiency in fuel practice; periodical inspection of sources of fuel supply; investigation of practice by means of schedules and personal investigation; control and use of fuels, including grading, classification, and allocation; the introduction of index figures as to consumption of fuel per unit of output; training of pupils; training of staff and workmen and granting of certificates of competency. Finance: Funds to be guaranteed by the federation for the first three years of the committee's activities: During the first year the cost of the scheme in salaries, travelling, and office expenses, is estimated at £5,000; but it is felt that this charge on the federation funds would soon disappear, and the department become self-supporting. A firm obtaining individual assistance would be charged at a rate which would cover the cost of the investigation.

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THE NOVEMBER GOLD OUTPUT IN DETAIL.

Decrease of 45,752 Ozs.—Falling Off in Labour Supply—70 Less Stamps at Work.

In November 677,970 ozs. of fine gold were produced in the Transvaal compared with 723,722 ozs. in the longer month of October, a decrease of 45,752 ozs. Last month's total, however, is 19,269 ozs. better than that for November, 1918. The figures for the past month as announced by the Chamber of Mines are as follows:—

WITWATERSRAND

	Ozs.	Value.
October	705,313	£2,995,979
November	657,845	2,794,348
Decrease ...	47,468	£201,631

OUTSIDE DISTRICTS.

November	20,125	£85,486
October	18,409	78,195
Increase ...	1,716	£7,291

GRAND TOTAL.

October	723,722	£3,074,174
November	677,970	2,879,834
Decrease ...	45,752	£194,340

Tht results from most of the Witwatersrand mines were adversely affected by the serious shortage of native labour. In several instances stamps had to be hung up. The number of natives employed on the gold mines last month was 164,671, or 2,818 less than the number in October, while the number of stamps in operation shows a decrease of 65. Only four companies showed an increase, viz.: Brakpan Mines, £2,918; Aurora West, £1,206; Geldenhuis Deep, £1,188; and Geduld Proprietary, £998.

STAMP POSITION.

The following are the official figures regarding the stamp position:—

	Rand.	Outside.	Total.
October	7,924	290	8,214
November	7,854	295	8,149
Decrease ...	70	–	
Increase ...	---	5	- -

NATIVE LABOUR.

The native labour figures for the past three months are as follow:—

	Sept.	Oct.	Nov.
On gold mines	169,120	167,499	164,671
On coal mines	12,392	12,691	12,565
On diamond mines ...	5,294	4,492	4,337
	186,806	184,682	181,573

COMPANY RETURNS.

WITWATERSRAND.

	Value. £	Increase. £	Decrease. £
Aurora West ...	14,485	1,206	- -
Bantjes ...	277	—	113
Brakpan ...	78,171	2,918	
City and Suburban ...	28,443	—	4,604
City Deep ...	100,480	—	9,056
Cons. Langlaagte ...	49,571	-	3,836
Cons. Main Reef ...	70,109	—	3,874
Crown Mines ...	233,285	—	17,102
Durban Roodepoort Deep .	28,604	—	1,606
E.R.P.M. ...	152,026	—	9,120
Ferreira Deep ...	45,446	—	553
Geldenhuis Deep ...	52,625	1,188	—
Geduld ...	68,452	998	—
Government Areas ...	199,299	—	18,529
Jupiter ...	26,404	—	4,740
Knight Central ...	29,237	—	2,069
Knights Deep ...	61,490	--	3,139
Langlaagte Estate ...	42,154	—	5,191
Luipaardsvlei ...	15,288	–	2,374
Meyer and Charlton ..	37,427	–	4,230
Modder B. ...	114,706	—	9,277
Modder Deep ...	94,100	—	4,375
New Goch ...	13,130	—	1,376
New Heriot ...	14,302	—	920
New Kleinfontein ...	66,451	—	6,190
New Modder ...	172,144	—	123
New Primrose ...	15,904	—	1,677
New Unified ...	11,108		824
Nourse Mines ...	49,320	–	778
Princess ...	22,322	—	5,229
Randfontein ...	155,148	—	22,493
Robinson ...	38,089	—	5,251
Rose Deep ...	52,315	—	10,517
Roodepoort United ...	20,720	—	4,405
Robinson Deep ...	73,898	–	7,098
Simmer and Jack ...	51,296	—	5,963
Simmer Deep ...	45,901	—	7,393
Springs ...	72,025	--	5,874
Van Ryn Estate ..	31,926	--	977
Van Ryn Deep ...	109,421	–	3,857
Village Deep ...	60,681	—	8,109
Village Main Reef ...	22,555		1,436
West Rand Cons.	35,498	-	3,581
Witwatersrand ...	36,569	–	2,663
Wit. Deep ...	31,527	--	1,470
Wolhuter ...	36,581	—	608
Miscellaneous ...	13,258	4,667	—

OUTSIDE DISTRICTS.

Sub Nigel ...	23,910	925	—
Glynn's Lydenburg ..	6,958	1,436	—
T.G.M.E. ...	25,949	77	–
Barrett ...	892	30	—
Miscellaneous ...	27,777	4,823	—

GROUP PROFITS.

	Sept.	Oct.	Nov.
Central Mining ...	£251,444	£287,003	£256,309
Barnato ...	176,048	180,188	148,814
Gold Fields ...	20,077	19,658	10,382
General Mining ...	25,861	26,667	18,557
Mines Selection ...	40,634	39,844	40,935
Union Corporation ...	73,403	77,625	71,443
	£587,467	£630,985	£546,440

MONTHLY RETURNS.

	1918. Ozs.	1919. Ozs.
January ...	714,182	676,059
February ...	659,759	636,728
March ...	696,281	712,379
April ...	717,099	694,944
May ...	741,317	724,995
June ...	727,696	702,379
July ...	736,199	725,497
August ...	740,210	706,669
September ...	708,206	698,558
October ...	679,764	723,722
November ...	658,701	677,970

THE NOVEMBER OUTPUT: GROUP RETURNS.

Barnato Group.

The results of operations of the Barnato group for November are as follows:—

Mine.	Stamps.	Tons Crushed.	Revenue from Gold
Consolidated Langlaagte ...	100	36,500	£49,572
Government Areas	180	109,000	199,301
Langlaagte Estate	200	32,600	42,156
New Primrose	100	15,000	15,905
New Unified	60	9,600	11,107
Randfontein Central	600	135,700	155,150
Van Ryn Deep	90	46,500	109,421
Witwatersrand	215	31,800	36,567
Totals and averages ...	1545	416,700	£619,179
October totals	1565	470570	£678,240

Mine.	Total Working Costs.	Working Costs per Ton Milled. Shillings.	Gross Profit including Sundry Revenue.
Consolidated Langlaagte ...	£41,833	22·922	£8,008
Government Areas	118,929	21·822	80,957
Langlaagte Estate	40,006	21·543	2,384
New Primrose	14,875	19·833	1,111
New Unified	9,588	19·975	1,546
Randfontein Central	160,834	23·704	*4,847
Van Ryn Deep	53,259	22·907	56,553
Witwatersrand	34,928	21·967	3,102
Totals and averages ...	£474,252	22·762	£148,814
October totals	£502,022	21·357	£180,188

*Loss.

£170,255: September, £176,048; October, £180,178; November, £148,814.

Randfontein Central.—Operations adversely affected by various causes, mainly through heavy caving of ground in southern sections, alsi by large influx of water at Mynpacht section, resulting in loss of tonnage milled and efficiency.

Note.—These results do not include the increased price now being obtained under the new arrangement for the free disposal of the gold shipped since 25th July last. The gold so far sold has realised a premium of approximately 17 per cent. Any increased profits obtained by tht companies will be pubished quartery after receipt of account saes.

Transvaal G.M. Estates.

The following are the particulars of the output of the Transvaal G.M. Estates for the month of November:—Central Mines: Tons crushed, 12,300, yielding 4,365 fine ozs. Elandsdrift Mine: Tons crushed, 1,400, yielding 1,038 fine ozs. Vaalhoek Mine: Tons crushed, 1,840, yielding 706 fine ozs. Estimated value of month's output, £25,640; estimated profit for the month, £4,659.

Glynn's Lydenburg.

The following are the particulars of the output of Glynn's Lydenburg for the month of November: Tons crushed, 3,548, yielding 1,638 fine ozs. Estimated value of month's output, £6,948; estimated profit for month, £2,776.

T.G.M.E. and Glynn's Lydenburg.—The published results do not include the increased price now being obtained under the new arrangement for the free disposal of the gold shipped since 25th July last. The gold so far sold has realised a premium of approximately 17 per cent. Any increased profits obtained by the companies will be published quarterly after receipt of account sales.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of November of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs	Total Profit
Simmer and Jack ..	320	7	47,100	12,076	£3,796
Robinson Deep	140	9	50,200	17,397	10,635
Knights Deep	400	11	82,600	14,476	*5,141
Simmer Deep	220	10	45,800	10,806	*3,560
Jupiter	80	5	23,200	6,216	*432
Sub Nigel	30	2	8,900	5,629	5,084
Totals	1,190	44	257,800	66,600	£10,382

*Loss.

Gold in reserve.—Simmer and Jack, 1,125 ozs.; Robinson Deep, 1,810 ozs.; Sub Nigel, 2,290 ozs.; total, 5,225 ozs.

The published results do not include the increased price now being obtained under the new arrangement for the free disposal of the gold shipped since 25th July last. The gold so far sold has realised a premium of approximately 17 per cent. Any increased profits obtained by the companies will be published quarterly after receipt of account sales.

Southern Van Ryn.

Assay results for No. 17 borehole are supplied by the General Manager, Southern Van Ryn Reef G.M. Co., Ltd., as under:—At 251 feet, 9 feet 4 inches of reef assayed, as follows: 12 inches assayed 0·5 dwt. = 6·0 inch dwts.; 13 inches assayed 1·0 dwt. = 13·0 inch dwts.; 12 inches assayed 1·0 dwt. = 12·0 inch dwts.; 12 inches assayed 1·0 dwt. = 12·0 inch dwts.; 13 inches assayed 8·0 dwts. = 104·0 inch dwts.; 13 inches assayed 1·0 dwt. = 13·0 inch dwts.; 13 inches assayed 1·5 dwts. = 19·5 inch dwts.; 12 inches assayed 0·5 dwt. = 6·0 inch dwts.; 12 inches assayed 2·0 dwts. = 24·0 inch dwts.; total, 112 inches, 209·5 inch dwts., averaging 1·87 dwts. over 112 inches. At 267 feet, 6 inches assayed 1·0 dwt. = 6 inch dwts. At 279 feet, 12 inches assayed 1·5 dwts. = 18 inch dwts. This last reef rested on a shale footwall.

Witwatersrand Deep.

The estimate of the results at the Wit. Deep for the month of November are as under: Tons milled, 26,400; gold recovered, 7,422·253 fine ozs.; average number of stamps running, 155; stamps running time, 21·58 days; tube mills, 5; development footage, 223 feet. Being of opinion that the publication of percentages in regard to the premium on the sale of gold does not convey sufficient definite information to shareholders, the board has decided for the future to estimate the value of the gold on the basis of the price already realized. The London office advises that gold is now over £5 per ounce, with the price rising, and the Transvaal Chamber of Mines reports that the premium on the gold already realized amounts to 17 per cent. (making about £5 per ounce). The directors have therefore estimated the value of gold won at £5 per fine ounce, and on this basis the working revenue for the month is £37,211 or 28s. 2·4d. per ton. The working expenditure for the month is £33,961 or 25s. 8·9d. per ton. The estimated working profit is £3,250 or 2s. 5·5d per ton. The exact amount realised from gold will be published from time to time as account sales are received for the information of shareholders, showing the further premium obtained. The fall in tonnage is due ti an accident in the east shaft, resulting in hauling being suspended for three days, and also to the continued shortage of native labour. The total labour strength has decreased since 30th June by 731 boys.

Central Mining/Rand Mines Group.

The following are the results of crushing operations of the Central Mining/Rand Mines companies for the month of November:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Total Fine Ozs.	Total Estimated Profit.	Estimated Working Costs per Ton.
City Deep	A154	10	54,000	23,655	£30,845	25/11
Cons. Main Reef	220	6	44,000	16,515	8,555	27/ 7
Crown Mines ...	660	26	163,000	54,817	49,386	22/ 6
Dur. Rood. Dp..	100	3	20,700	6,734	*5,057	32/ 6
East Rand Prop.	440	19	126,000	35,811	10,048	22/ 4
Ferreira Deep ...	160	7	30,400	10,344	4,033	27/ 4
Geldenhuis Deep	300	7	44,100	12,390	*2,579	24/ 8
Knight Central .	120	3	21,000	6,797	521	26/ 8
Modder B.	B104	8	50,000	27,004	52,028	24/ 9
New Modder ...	C236	15	77,000	40,526	95,461	20/ 4
Nourse Mines ...	180	5	38,000	11,611	*1,335	26/ 4
Robinson	215	6	41,000	8,967	2,319	18/ 6
Rose Deep	300	7	44,700	12,316	5,484	20/ 8
Village Main Rf.	130	4	17,900	5,310	1,567	23/ 8
Wolhuter	120	4	27,000	8,574	4,958	22/11
Village Deep ...	180	7	44,900	14,328	80	26/ 9
Tls. & averages	3,619	137	843,700	295,699	£256,309	23/ 8

A Includes 4 Nissen stamps. B Includes 24 Nissen stamps. C Includes 56 Nissen stamps.

* Loss.

Rose Deep, Ltd.—Reduced profits chiefly due to fall in the tonnage milled on account of the lower native labour supply.

General.—The published results do not include the increased price now being obtained under the new arrangement for the free disposal of the gold shipped since 25th July last. The gold so far sold has realised a premium of approximately 17 per cent. Any increased profits obtained by the companies will be published quarterly after receipt of account sales.

The supply of native labour continues unsatisfactory, the total number of natives employed by the group being 1,400 less than October.

Consolidated Mines Selection Group.

The following are the results of operations for the month of November, 1919:—

	Stamps Working.	Tons Milled.	Working Costs per Ton Milled
Brakpan Mines	110	44,000	28/ 1·414
Springs Mines	80	36,200	28/ 4·087
Totals and averages ...	190	80,200	28/ 2·618

	Value of Gold declared.	Yield per Ton.	Working Profit.	Working Profit per Ton.
Brakpan Mines ...	£82,188	37/ 4·298	£20,329	9/ 2·884
Springs Mines ...	71,902	39/ 8·699	20,606	11/ 4·612
Totals & averages	£154,090	38/ 5·117	£40,935	10/ 2·499

The published results do not include the increased price now being obtained under the new arrangement for the disposal of the gold shipped since 25th July last. The gold so far sold has realised a premium of approximately 17 per cent. The increased profits obtained by the companies will be published quarterly after receipt of account sales.

Brakpan.—Taken from gold reserve, 1,000 fine ozs.; balance reserve at date, 4,724 fine ozs.

Union Corporation.

Results of operations on the producing mines of this group for the month of November:—

Company	Stamps.	Tons Crushed.	Total Revenue.	Revenue per ton.
Geduld Proprietary . . .	100	44,200	£68,892	31 2
Modder Deep Levels ...	70	40,700	93,970	46/ 2
Princess Estate	60	17,800	22,837	25 8
Totals	230	102,700	£185,699	—

Company.	Costs. Total.	Costs. Per Ton.	Profit. Total.	Profit. Per Ton
Geduld Proprietary .	£46,793	21/ 2	£22,099	10 0
Modder Deep Levels ...	40,008	19/ 8	53,962	26 6
			£76,061	
Princess Estate . .	27,455	30 10	*4,618	5 2
Totals	£114,256	—	£71,443	—

* Loss.

Princess Estate.—This company's results were adversely affected by extreme shortage of native labour.

The published results do not include the increased price now being obtained under the new arrangement for the free disposal of the gold shipped since 25th July last. The gold so far sold has realised a premium of approximately 17 per cent. Any increased profits obtained by the companies will be published quarterly after receipt of account sales.

Albu Group.

The following information is supplied regarding the November operations of the producing mines of the General Mining group:—

Company	Tons Crushed.	Cost.	Cost per Ton.	Total Revenue.	Profit.
Aurora West ...	13,000	£16,791	25·83	£14,415	*£2,376
Meyer & Charl.	13,000	15,880	24·43	37,180	21,300
New Goch ...	13,100	12,806	19·55	12,540	*266
Roodepoort Un.	20,800	24,264	23·33	20,850	*3,414
Van Ryn Est...	31,100	28,137	18·09	31,852	3,715
West Rand Cn.	29,000	35,862	24·73	35,460	*402
	120,000	£133,740	22·29	£152,297	£25,015
				Less losses	£6,458
					£18,557

* Loss.

Roodepoort United.—Loss due to curtailment of tonnage owing to shaft accident, referred to in previous declaration of output.

The results from all the mines of the group were adversely affected by serious shortage of native labour, which is reflected in the smaller tonnage crushed and increased cost per ton.

The published results do not include the increased price now being obtained under the new arrangement for the free disposal of the gold shipped since 25th July last. The gold so far sold has realised a premium of approximately 17 per cent. Any increased profits obtained by the companies will be published quarterly after receipt of accounts sales.

THE WEEK IN THE SHAREMARKET.

Strike Troubles Upset Dividend Anticipations—Prices Irregular—Less Activity.

THE stupid strike of "aliens and rebels" at the Simmer Deep had a depressing effect on the market this week. It certainly goes to show the union people in their true colours, and the result is not an edifying one. The trouble has spread to the Jupiter, but, fortunately, the men on the neighbouring mines are not going to be dragged into the quarrel. The market has lost some of its buoyancy, though several stocks, notably New Modders, show handsome rises during the week. The very successful showing at the New Modder annual meeting had an immediate effect on the quotation and the Modder East meeting was also regarded as most satisfactory. Most of the other popular good stocks improved at the beginning of the week on the increasing gold prices and the dividend prospects. As the week progressed, quotations eased and business slackened. In diamonds there was also less doing, and quotations were more erratic. Tins also were quieter. The week's changes are shown below:

	Fri. 5th.	Sat. 6th.	Mon. 8th.	Tues. 9th.	Wed. 10th.	Thurs 11th.
African Farms	17 0	16 9	17 0†	16 6	16 6†	16 6*
African and Europ.	16 6*	—		17 6*	17 6*	17 6*
Anglo-Am. Corp.	59 6	57 6	57 6*	58 3	58 0	55 6*
Apex Mines	8 0†	7 6	7 6*	7 9†	7 6*	7 6
Aurora Wests	7 6*	—		—	-	—
Bantjes Cons.	3 5*	5 0	5 0	5 3	5 4	5 0*
Blaauwbosch Dmds.	—	—		—	90 0†	90 0†
Brakpan Mines	—	70 0	72 6	75 0	75 0†	74 0*
Breyten Collieries	9 6*	9 6*	—		—	—
Brick and Potteries	4 6*	4 6*			—	—
British South Africa.	24 0†	—	—	23 0*	—	—
Bushveld Tins	2 11	2 9	2 9	2 11	2 9	2 6*
Cinderella Cons.	6 9	7 3	6 9*	6 9*	7 0	7 0*
City and Subs.	7 9*	8 0	8 0*	9 0	8 6	—
City Deeps	62 0*	62 6a	65 0	65 0	65 6*	65 0*
Clydesdale Collieries.	—	28 9*	29 0†	29 0	29 0*	29 6
Con. Investments	—		30 0*	31 6*	-	30 0*
Con. Langlaagtes	—	22 6	22 6	24 0	24 0*	22 6
Con. Main Reefs	13 0*	13 3*	14 0	14 0	13 9	13 4½
Con. Mines Selection	37 0	38 6		41 0	41 0†	36 0
Coronation Collieries.	—		75 0†		71 0†	71 0†
Coronation Freeholds.	2 6	2 7	2 6	2 6*	2 4*	2 5
Coronation Syndicates	11 0*	15 0*	-		12 6*	15 0*
Crown Diamonds	13 9	12 0	13 0	12 9	12 1½	14 0
Crown Mines	68 6*	68 6	70 0	72 0	70 0*	71 0
Daggafontein Mines	21 9	21 6	20 6	20 0	20 0	19 3
Do. Options	3 4	3 6	3 3†	3 6†	2 0	1 9
Durban Rood. Deeps	8 6†	8 6†	7 9*	8 0*	8 3*	6 0*
East Rand Coals	2 6*	2 8	2 8*	2 10	2 9*	2 9*
East Rand Deeps	1 1*	1 1*	1 3	1 2*	1 3*	1 5†
East Rand Minings	25 0†					—
East Rand Props.	12 9	12 7½	13 0	13 0	12 3	11 6
East Rand Debs.	£67½*	£67½*	£67½	£70*		£70*
Eastern Golds	2 0†	1 10†	1 11†	2 0†	1 6*	—
Ferreira Deeps	11 6†	—		—		—
Frand Smith Dmds.	10 3	10 3	10 3	10 3	10 0	9 9
Geduld Props.	60 6	60 0a	61 0	61 9	61 6	61 0a
Geldenhuis Deeps	—		10 6*		12 6*	—
General Minings	10 0†	10 0†		9 9†	10 0†	9 0
Glencairns	—	1 6*	1 3*	—	1 0*	
Glencoe Collieries	5 9*	5 9*	-	5 9		
Glynn's Lydenburgs	17 6*	19 0†	18 6		20 0†	
Govt Areas	102 6	102 0	104 6	103 6	103 0	101 6a
Hume Pipes	22 0*	22 6*	23 0	24 0	23 0*	24 0†
Jhb. Bd. of Ex.	33 0*	—	—	33 0*	33 0*	33 0*
Jupiters	5 9	5 11	6 6	6 6	6 3	6 6
Klerksdorp Props.	2 1*	2 0*	2 1*			2 0*
Knight Centrals	—	6 9	7 0	7 2	7 2	—
Knights Deeps	—	9 0*	9 6*	9 0*	9 0	
Lace Props.	21 6*	21 3*	—	21 3†	20 0	19 6*
Leeuwpoort Tins	32 0	31 3	32 0	31 0*	31 6	31 6*
Luipaardsvlei Est	5 0†		5 0	6 6	7 3	7 0*
Lydenburg Farms	9 3	9 2*	9 2	9 1*	9 0	
Meyer and Charltons	95 0*			95 0*	94 6*	92 6*
Middelvlei Est.	2 5†	2 4*		2 4*	2 4	2 4
Modder B's	183 0	183 0	185 0	187 6	190 0	187 6
Modder Deeps	56 3	56 1½	56 3	56 0	55 9	55 6
Modder Easts	32 3	32 0	32 6	32 9	31 6	30 6
Do Opts. (3 yrs.)	13 3	13 3	13 6	13 3	12 3	11 6
Do Opts (4 yrs.)	15 3	15 0	15 0	15 6	14 7	13 6
Natal Navig Colls	29 0*	29 6*	—	28 6*	—	29 0*
National Banks	300 0†	—	—	300 0†		295 0†

	Fri. 5th.	Sat. 6th.	Mon. 8th.	Tues. 9th.	Wed. 10th.	Thurs. 11th.
New Boksburgs	2 6	2 9	2 9	2 9†	2 1*	2 1a
New Eland Diamonds	—	87 0	90 0a	90 0†	82 0*	82 6
New Era Cons.	12 3*	12 3	12 6	12 7	12 6*	12 6*
New Geduld Deeps	2 4	2 3	2 3*	2 4	2 3*	2 4*
New Heriots	10 0*	10 0†	9 6	8 6*	8 0*	8 0*
New Kleinfonteins.	13 3	13 3	13 10	14 4½	14 0	15 9
New Modders	£32½	£32⅝*	£33½	£34¼	£34¾	£34½
New States	32 6*	32 3	33 0	33 0*	32 9*	—
New Primrose	—	—	—	—	2 3*	—
New Unifieds	5 6*	—	5 6*	5 6*	5 6*	5 9*
Nourse Mines	14 6†	14 6†	13 6*	14 9	14 0*	16 0
Pretoria Cements	98 6*	100 0	103 0*	102 9	104 0*	100 0*
Princess Estates	3 4†	3 6	3 6	3 0*	3 0	3 1*
Rand Collieries	—	—	3 0*	4 0*	4 3	4 3*
Rand Nucleus	—	2 0	2 1*	2 2	2 2*	2 2*
Rand Select. Corp.	107 6	105 0a	106 0*	107 6	106 3*	106 3
Randfontein Deeps	6 9	6 3*	6 0*	6 3*	6 4*	6 3*
Randfontein Estates	24 9	24 6	25 0	25 6b	26 0	25 3*
Roberts Victors	22 0	23 0	23 0	23 3	21 0	20 0
Rooibergs	9 9	10 0	10 0	9 0	8 9	8 6
Roodepoort Uniteds	—	-	4 0*	—	—	4 0*
Rose Deeps		-	21 0*		—	—
Rouxville Diamonds	27 6a	26 6	27 3	26 0*	27 0	27 6
Ryan Nigels	5 0†	-	—	4 3*	4 3*	4 9†
Shebas	2 0	2 3	2 6		2 4	—
Simmer and Jacks			6 0*		6 0*	6 0*
Simmer Deeps	2 6*	2 6*	2 6*	3 0*	2 9	2 9
South Van Ryns	8 9*	8 9*	8 9*	8 9*	8 9*	8 9*
S.A. Alkali	38 6	36 6	27 0	29 0	28 0	25 9*
S.A. Breweries	45 0*		45 0*	50 0†	46 6*	
S.A. Lands	7 0*	7 1	7 1	7 0*	7 2	7 0
Springs Mines	56 6	57 0	57 3	57 6	56 0a	56 6
Sub-Nigels	20 6*	20 9	20 6*	20 0*	20 6	20 3
Swaziland Tins	17 0†	17 0†	17 0†	—	17 0†	—
Transvaal Lands	30 0†	30 0†	30 0†	30 0†	30 0†	30 0†
Trans. G.M. Est.	15 6†	13 6*	14 3*	14 6*	15 0	15 9
Trans. and Del.	80 0*	—	—	—	—	—
Tudors	—	1 7†	—	1 3*	—	1 4*
Tweefontein Colls	26 0*	26 0*	26 0*	26 0*	26 0*	26 0*
Union 4½ per cent.	£102½*	£102½*	£102½*	£102*	£102*	£102*
Union 5 p. c. Tax	£104*	£102½*	£104*	£104	£104*	£103¾†
Union 5 per cent	£103*	£103¼*	£103½	£103½	£103¾	£103½*
Van Ryn Deeps	97 6	97 3*	98 3	98 6	99 6	100 0
Van Dyks	3 9	3 8	3 6*	3 6*	3 6	3 9†
Victory Monarch	33 6	34 0	35 0*	38 0*	38 6*	40 6
Village Deeps	14 6*	12 6a	16 3	16 0*	16 0*	16 3†
Village Main Reefs	-	-	9 0†	7 6†	—	—
West Rand Cons	—	—	7 6†	7 0†	7 6†	7 0†
Western Rand Est.	11 0		10 6*	10 3*	10 6*	10 0*
West Springs	26 3	25 6*	25 0	25 6	25 6	24 9
Do. Options	9 6*	9 9*	9 9	9 6*	9 6	9 0†
Witbank Collieries.	87 6†	—	87 6†	87 6†	87 6†	—
Witwatersrands	20 0†			18 6*	20 0†	20 0†
Wit. Deeps	9 6	9 6*	10 0	10 6	10 6	9 6*
Wolhuters	4 2	4 3	4 4*	5 0	6 6	6 0
Zaaiplaats Tins	10 9	10 4	10 3		9 6*	9 6

*Buyers. †Sellers. aOdd lots. bEx London.

Geological Society of South Africa.

The next monthly meeting of members of the Geological Society of South Africa will be held in the Council Chamber, Chamber of Mines, Johannesburg, this (Saturday) evening, 13th December, at 8.15 o'clock. Business: The minutes of the special general meeting and ordinary monthly meeting of members held on 15th September will be read. The following papers will be open for discussion: "A Review of the Reptilian Fauna of the Karroo System of South Africa," by S. H. Haughton, B.A., etc., Assistant Director, South African Museum; "The Geology of the Country Around Pasipas, near Bulawayo," by A. J. C. Molyneux; "The Coastal Limestone of the Cape Province," by W. Wybergh; "The Geology of the Sabi Valley, Mashonaland," by F. P. Mennell, M.I.M.M. The following papers will be read: "Some Notes on the Geology of a Portion of the Natal Coal field," by F. A. Steart; "Pleistocene Movements in Sierra Leone," by F. Dixey, M.Sc., etc., Government Geologist, Sierra Leone (communicated by Dr. A. W. Rogers).

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OF THE

"SOUTH AFRICAN MINING AND ENGINEERING JOURNAL."

TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Mine Equipments Checked by High Prices—American Exchange also a Stumbling Block—The Trend of Affairs—Iron, Steel and Machinery—Timber and Building Materials—Acute Brick Shortage—Pig Iron Industry—Electrical Materials.

The important feature of Thursday morning was the discussion on the Modder East meeting. The mining material merchants were much disconcerted that the directors had decided to postpone their efforts to secure a plant to crush 40,000 tons monthly, similar to that erected by the Modderfontein G.M. Co., which had been operating for about 18 months. Engineers in Great Britain and America reveal a state of affairs under which it was practically impossible to consider the ordering of the plant chiefly owing to the high prices asked. They would not for one moment abate their efforts, but they considered it their clear duty to procure it at a more reasonable price and not to cripple the company by an enormous capital expenditure involved in purchasing of plant at the existing price of material and machinery. Possibly during the next year or two the prices of machinery and materials might come down to reasonable levels. As a set off to the disappointment the directors had secured the Apex reduction plant. So far as these notes are concerned, the crux of the whole matter is that here is a company with ample funds and backed by a leading group, deliberately deciding not to purchase a reduction plant, because, as they say, of the extraordinary prices prevailing in Great Britain and America, and a significant remark was made that during the next year or two the prices of machinery and materials might come down to a reasonable level. Hence, if this applies to one new mine, naturally it applies to the whole lot. Therefore it is no wonder that mining material merchants are much perturbed. As a slight set off against their pessimism a shipping clerk stated that 38 barrage gates for the Vaal River water scheme were coming out from Kilmarnock, representing 3,000 tons of cargo, which, he thought, was encouraging to Great Britain. Judging from this indication it may be that machinery may be arranged for from Great Britain at any time during next year. If we could get an intensified productive wave in England there would be a wonderful chance of retaining the South African trade as against America now that the British pound only represents about 16s. 2½d. in New York. Unfortunately prices are advancing in Johannesburg because of the trouble of getting material from either Great Britain or America. Merchants recognise the position, and are purchasing from one another rather freely, even on the speculative side, although the primary idea is to keep up fairly assorted stocks.

THE TREND OF AFFAIRS.

Business is very quiet indeed on the Commercial Exchange as the mines are buying very carefully in view of their stock-taking at the end of the year and using up everything possible for their reserves. Hopes are entertained that this parsimonious attitude will not be so tight after the end of the year, owing to the appreciation of gold relieving the whole of the gold mining position. Outside the Commercial Exchange business is not so restricted, as the general demand is not at all bad from the railways, municipalities and gold mines through Rhodesia into the Belgian Congo. Some of the original prospectors and financiers connected with the African Oils Company have recently [illegible] some nice cheques, and it is satisfactory to note that the Johannesburg people, through their energy and foresight, have floated this company to a successful issue into its preliminary stages. And also it is satisfactory to note that we can depend upon ourselves both from a prospecting and financial view in connection with Pretoria Cement, Hume Pipes, South African Alkali, several tanneries, and so forth. A new factory is starting at the corner of Mooi and Fox Streets for the making of aluminium pots and pans and other household requisites. There has been a difficulty in supplying electric power by the municipality, therefore the proprietors have had to improvise a boiler and steam engine for the necessary power. All the other factories such as for fencing, secondhand yards, agricultural machinery, timber yards, breweries and other industrial concerns within the first tramway stage are making the general office as a part and parcel of the factory, the telephone being the medium of combining the office and warehouse, etc., and so saving an office rent in the centre of the town.

IRON, STEEL AND MACHINERY.

All hardware goods and machinery are quietly increasing in price on account of the difficulty in obtaining materials from Great Britain and America, also the American adverse exchange has a lot to do with the nervous and uncertain position. Transvaal iron and mild steel are in good demand for the engineering shops and foundries, also they are being sent to all parts of the Union, even Delagoa Bay had a large consignment during the week. Prices of steel plates are from 42s. 6d. to 55s., according to the thickness, say, 1/16 in. is 55s. 0d., and ½ in., 42s. 6d. Fencing wire, No. 8, is 37s. 6d.; barbed wire, 35s., 98 lbs. Shovels are 65s. dozen, and wheelbarrows 50s. each. Tubular wheelbarrows cannot be purchased in any quantity. Wire nails are also dearer and some sizes are out of stock. Imported mild steel is 35s. 6d. to 37s. 6d.; bar iron, 35s. to 40s., both with an advancing tendency; brass rods, 2s. 3d.; brass plates, 4s. 6d.; tool steel, high speed, 5s. 6d., low speed, 1s., and drill steel 7½d. lb. The secondhand yards are bare of machinery, and it is difficult to anticipate where supplies are coming from. The

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feature is the demand for loco-typed boilers, many of which have been sent to the Belgian Congo from month to month. Engineering shop lathes are in demand, and providing the kinds wanted can be had, good prices are always forthcoming.

Second-hand Timber and Iron.

Things remain much about the same in the second-hand timber and iron yards. Timber is hardening; for new, 1s. 10d. is being paid, and for second-hand, 1s. 6d. to 1s. 7d., of which latter there is very little on hand. Iron is arriving in fairly large quantities, but the demand is so great that the effect of such consignments has but a small effect in reducing orders on hand. Owing to the scarcity of second-hand iron no reliable quotation can be given, but it may be given as nominally 1s. 6d. for immediate delivery and to arrive 1d. less. Orders are very plentiful, but though much against the grain, many have to be declined. One yard had to refuse an order amounting to £2,000, owing to absolute inability to execute the commission for want of stocks.

Timber and Building Materials.

The price of deals is a fraction higher for the ordinary lengths and more for twenty feet's. Ordinary, 1s. 8d.-1s. 9d. and up to 20 ft. 2s. per foot. Floorings, 9¼d. to 9½d. Ceilings, 6¼d. to 6½d. Pitchpine, 10s. 6d., and Oregon 9s. to 9s. 6d. per cube. Deals are scarce as a general statement, although some yards are not so bare as others. Floorings are very scarce, but ceilings are fairly plentiful, as the demand for the latter is not over great now that beaver boards and asbestos as well as steel ceilings are put into the great majority of buildings. As regards ready-made joinery, only imported doors are used in South Africa. Windows, casements, and such like are made in factories at the coast and a little in Johannesburg; of course, much is made in the builder's own yards. Rhodesian hard wood timbers are making greater headway from month to month into the Johannesburg market, also a bastard yellow wood from Griqualand has come into favour for shelving, being equal to the imported, and is very like clear pine. The demand from the mines is larger than current supplies, also over ten thousand feet has been delivered to our Municipality during the month. The chief woods from Rhodesia are teak, mahogany and mukwa. The Baltic timber trade is uncertain for any future period, because of the present urgent demands from Great Britain and Europe, therefore South African dealers are content to keep present contracts going and not enter into others for more than two or three months, and then only for specific buildings. The brick question has got into an acute stage, as it has come under the writer's personal experience through a sudden removal of stables, that it is practically impossible to obtain 20,000 bricks to build new stabling until after the middle of January. One sees plenty of bricks being delivered, but those are from old contracts. It seems almost ludicrous that in a place like Johannesburg (and the Reef brickyards) so few bricks can be had for immediate delivery when the price and the money are good, but there it is, a positive fact. Again, ten bags of cement were wanted, and the price asked was 15s. each for spot delivery, but a firm booked the order for the middle of January at the recognised price of 10s. 6d., without any guarantee for actual delivery. Hence a stable has been hired until the end of February. There is an idea that stables are easy to get through the encroachment of the garages in all parts of the town, but stables within the penny-halfpenny stage are difficult to obtain simply because when the various properties are sold more substantial buildings are erected, and so the stables disappear. It so happens that these stables leased until the end of February are all coming down to make room for commercial buildings.

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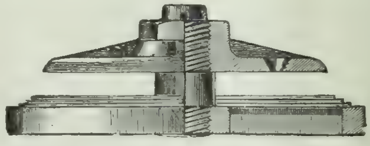

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THE PIG IRON INDUSTRY.

If that little dinner party, some long time ago, when arranging for the first furnace in Pretoria, only knew the interest and even anxieties the foundry men and engineering shops in Johannesburg took in their efforts to make pig iron, it would surprise even them. They started off with unbounded enthusiasm with their brains and money, and after all nothing can be done without a super-abundance of enthusiasm. Well, at their annual meeting on Wednesday at Pretoria things were looking brighter and better after their initial difficulties—and they were many and exceptionally trying. Already 2,000 tons of iron has been produced, and all the Nos. 1 and 2 have been sold, and there are regular customers for Nos. 3 and 4 qualities. It was stated that the experiments made in casting pipes by the centrifugal methods gave every promise of success. In general the outlook for the iron and steel industry is very bright, especially as the prices in Britain and America are dearer than ever, whereas it was expected after the War that values would have considerably fallen. Therefore South Africa was in a very favourable position with its abundance of cheap iron ores and fuels. Now comes the crux of the whole matter, and that is the preliminary stages of pig iron making are practically over, and the Pretoria people have taken their courage in both hands and are going in for the flotation of a substantial company through a big financial institution. They must be congratulated on this important adventure, as it is recognised that it requires a fairly big financial backing to run an up-to-date iron factory. The Government is very sympathetic, and has promised assistance which may assume the plan of giving Government and Railway orders for iron and steel, of which an almost unlimited demand are required. Already it is known that experiments have been made in manufacturing iron telegraph posts. However, not a moment has to be lost in rushing arrangements ahead, because Britain and America are only (labour) sleeping, and they will wake up before long very much in earnest to recover any lost ground through their present untoward circumstances. As regards capital monies neither country is wanting in that respect, as the fabulous amounts in the American steel concerns almost takes an ordinary man's breath away. Therefore now is the opportune moment for South Africa in this, as well as many other industries.

ELECTRICAL GOODS.

In the electrical material world the tendency all round is to harden, and a general rise in stocks is expected after the turn of the year, owing to the impossibility at present, and for some considerable time to come, of replacing same. Tubing and wiring are fairly well stocked, but when the present stocks are depleted—a matter of a month or so—the situation as regards future requirements looks rather gloomy. Lamp holders are very scarce indeed, and ceiling roses are still unprocurable. The market is quite bare of adaptors, for which people are offering almost any price, and none are expected here for a long time. This applies to the English article; of the Japanese make there are very few on hand. Business under the circumstances is very good, but many orders cannot be executed fully on account of the scarcity or absolute absence of certain materials. A fairly good business is being done in fancy lamps, etc., for the Christmas trade. It is said that the Belgian Congo, the railway and the municipalities are buying all electrical material very freely.

PERSONAL.

Major H. L. Templer, the well known Rand engineer, has returned to South Africa.

* * * *

Many of our readers will regret to learn that Mr. W. M. Gower, London secretary of Koffiefontein Mines, Ltd., died recently, at the early age of about 52 years.

Sir Bourchier Wrey, Bart, has been appointed the representative of the Rezende Mines, Ltd., on the Rhodesian Chamber of Mines, vice the late Mr. S. R. Jameson. Mr. A. R. Thomson has been appointed the representative of Wankie Colliery, Ltd., on the Rhodesian Chamber of Mines, vice Sir Bourchier Wrey, Bart.

* * * *

Mr. Holman, accompanied by his son, the well-known rock drill manufacturers, of Camborne, Cornwall, arrived at the Kolar goldfield on September 30 on a visit. Mr. C. F. Heathcote, superintendent of the Champion Reef mine, received them at the railway station. The two gentlemen are on an extensive tour, and have recently been to this country and Tasmania.

* * * *

Mr. Alexander Richardson has been appointed Principal of the Camborne School of Mines. Mr. Richardson is an old Randite, and in 1913-14 was president of the Chemical, Metallurgical and Mining Society of South Africa. As a teacher he has been a success as one of the demonstrators in the Royal School of Mines. For the past two years he has been secretary of the Privy Council's Department of Scientific and Industrial Research.

* * * *

According to the mail papers, Lord Harris, the greatly-respected chairman of Consolidated Gold Fields of South Africa, Ltd., has been confined to his room, owing to injuries received through being knocked down by a motor vehicle opposite Charing Cross Station. His injuries, which were confined chiefly to the face and side, were happily not serious. Whilst regretting the accident, everyone will rejoice that Lord Harris will soon be able to resume his ordinary occupations.

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ENGINEERING SECTION.

POWER SUPPLY ON THE RAND, FROM THE STANDPOINT OF THE MINING CONSUMER.

[By H. W. Clayden, A.M.I.E.E.]*

Several papers have been read before the Institute of Electrical Engineers during the last few years, giving particulars of the power stations and distribution system of the Power Company, but up to the present I cannot think that any figure has been given regarding the cost of generation and distribution. In discussing the questiin of the power supply from the point of view of the mining consumer, it is necessary to deal with the cost of supply, and I hope that any discussion or criticism of the existing methods of charging for that supply will not give offence to the officials of the Power Company, and if any figures given are instrumental in leading them to consider the supply from the standpoint of the consumer, it may result in mutual benefit to both parties concerned. The general power supply of the Witwatersrand has been in operation for ten years, and the reliability of the system leaves nothing to be desired so far as the consumer is concerned. The engineers of the company are to be congratulated on the way in which they have overcome the obstacles and defects which caused many of the frequent stoppages and dislocation in supply in the early days of operation. The power supply to the mining industry is given under two different agreements. (1) The agreement with the Rand Mines Power Supply Co., Ltd.; the consumers on this supply obtain power at 0·525d. per kw. hour without any load factor clause in the agreement, and are also supplied with compressed air at the same rate per air unit. (2) The agreement with the Victoria Falls and Transvaal Power Company, Ltd., under which the consumers obtain power at 0·525d. per kw. hour for a 70 per cent. load factor with a schedule rate of increase for any load factor below 70 per cent. The factor being based on the group maximum peak load hour during the month obtained from the reading of a printometer attachment to the main supply meter, this records the kw. hours registered at half-hourly intervals. One printometer is fixed at each point of main supply and all the clocks are synchronised. The sum of the maximum readings over any one hour for all the mines of the group is taken as the group peak load hour for that month. No compressed air supply is given under this agreement, but any consumer who instals motor driven compressors is entitled to a 5 per cent. reduction in the price of electricity for all kw. hours, metered separately, and used for such compressors. So far as the first agreement is concerned, the first rate of charge is the most suitable to the mines, and the price of the supply in general will be discussed later in this paper. Regarding the other agreement containing the load factor penalty clause, the first consideration is to analyse the mine power requirements and to note the effect of each on the individual mine load factor or group factor as the case may be. On any mine or group of mines the power requirements can be divided up under four main headings, the percentage of the maximum demand for each class is approximately as follows: (a) Stamp mills, tube mills and reduction plant, 30 per cent.; (b) surface hoist, transport, crushing and workshops, 25 per cent.; (c) air compressing plant, 30 per cent.; (d) mine pumping, underground mechanical ventilation and winding, 15 per cent.; total, 100 per cent. The above percentages will, I think, be found correct within one or two per cent. for each group of mines on these fields. The next point for consideration is the load factor obtainable on each of the above classes and each must be separately considered to ascertain what alteration in the group or mine peak load can be obtained by the alteration of the time of the peak load on each class of plant.

(*To be continued.*)

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PORTO RICO—San Juan, Mayaguez and Ponce. COSTA RICA—San José.
DOMINICAN REPUBLIC—S. Domingo, Puerto Plata, Sanchez, S. Pedro de Macoris and Santiago de los Caballeros.
MARTINIQUE—Fort de France.
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Antigua—St. John's. Bahamas—Nassau.
Barbados—Bridgetown and Speightstown. Dominica—Roseau.
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Capital Paid up and Reserves $33,000,000
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The Antelope Closed Down.

The directors of the Antelope Gold Mine (Rhodesia), Ltd., have for some time past had grave doubts as to continuing operations on the company's property, in view of the disappointing results during the last few months and the absence of encouraging prospects in the future. The local directors and engineer having been advised that the London board were of the opinion that operations should be discontinued, recommended that before deciding to close down, work should be continued for a time, and to this the directors agreed. They regret, however, to announce the receipt of a cable from Bulawayo to the effect that there has been a serious breakdown, causing complete stoppage of all surface plant, and that the local board of directors and the consulting engineer now recommend that the mine should be finally shut down, to which course the directors have agreed, and the necessary steps have been taken to cease all work. A further communication will be addressed to shareholders in due course.

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* From Paper read before S.A. I. of E.E.

DE BEERS ANNUAL MEETING.

At the annual meeting of the De Beers Consolidated Mines, Ltd., held in the Board Room of the company's offices at Kimberley on December 5, Colonel Sir David Harris, M.L.A., who presided, said, inter alia: In prosperous years we cannot distribute in dividends all the profits made. We have to provide for redemption of debentures due in 1930; we also feel bound to increase our reserves annually, so that in the event of a lull or set-back in the diamond market we can hold our diamonds and not be forced to place them on an unwilling market, which would bring down prices and shake the confidence of the trade. The knowledge that the big producers and the Diamond Syndicate will, so to speak, lock up their safes in the event of a falling off in the demand is the great factor in maintaining values and securing the manufacturers and dealers against losses. In the event of a temporary diminution in the demand for diamonds we must continue working our mines, and not be compelled to close them down as formerly for want of funds. All these matters necessitate the creating of a big cash surplus. Our reserves to-day, which appear to be large, are not quite sufficient for our obligations and responsibilities; therefore they should be gradually increased from year to year to provide the necessary capital for the industrial development we have in contemplation.

For the stabiliment of the diamond trade we have now £1,975,325 8s. 4d. set aside, which is a substantial increase on last year. Our current liabilities amount to £3,216,487. You will observe, by reference to the credit side of the balance sheet, that this large sum is well covered—in fact, shows a big surplus—in the items investments in stocks and shares, reserve investments, advances to subsidiary companies, open accounts, special investments, bills receivable, cash at bankers and sundry other credits.

I may mention that the cost per load for hauling and washing has further increased, namely, from 4s. 2.56d. to 5s. 0.94d. as compared with last year, due principally to the increased cost of labour and mining supplies.

WAR AND EPIDEMIC CONTRIBUTIONS.

The epidemic cost the company £198,800 8s. 10d., including a donation of £7,000 to De Beers Benefit Society, to assist that institution in paying the heavy demands upon its resources.

The sum of £165,642 had been expended in making up the difference to employees between the amount they received in salaries and wages and their full pay from September 1, 1914, to June 30, 1916.

A WAR RECORD.

During hostilities £433,334 had been paid in salaries and wages, etc., to workpeople whilst on active service. To this amount must be added the war gratuity of £150,000, divided amongst soldier employees according to period on active service. I am not mentioning this in any boastful spirit, but to satisfy you that, as our employees did their duty to their country, so we have tried to do our duty by them. (Hear, hear.) Our war donations to the Governor-General's and other funds amounted to £119,998 0s. 11d., making a grand total of £703,332 19s. 9d. (Applause.) Well, gentlemen, this is our war record, and it will, I feel convinced, commend itself to shareholders. (Applause.)

After referring to the arrangement by which the four big producers of diamonds, consisting of German West Africa, De Beers, Jagersfontein and the Premier companies, have agreed to sell through one channel, an arrangement which has given a new lease of life to the industry, the Chairman went on to give the principal heads of the agreements, namely:

(a) A contract for five years, which can be terminated at the end of two years, or by 12 months' notice after the expiration of the first year.

(b) All diamonds must be sold to the Syndicate during the continuance of the agreement, cash against delivery in South Africa, the Syndicate to bear all losses.

(c) The prices to be paid to the four producers in South and South-West Africa every succeeding quarter to be based on the net average price realised by the Syndicate for the respective quotas during the previous three months, less 5 per cent. Adjustments to be made quarterly.

The quotas were fixed as follows:

De Beers	51 per cent.
S.-West Protectorate..	21 per cent.
Premier Company	18 per cent.
Jagersfontein	10 per cent.

In addition to the initial price paid in South Africa, the producers receive a supplementary amount equivalent to half of the profits realised by the Syndicate in excess of 5 per cent. In this way the producers benefit by any rise in the market, but they do not share in any losses, which are borne by the Syndicate alone. On the whole, the terms agreed upon are very satisfactory, and will, I am sure, meet with your approval.

ALLUVIAL DIGGERS' POSITION.

The alluvial diggers were not parties to the conference, as it was recognised that they could not arrange to limit the value of their finds, so that they are in the happy position of selling unrestricted in any form whatever their total output and at greatly enhanced prices, due to the policy of the big producers, who, to adopt a phrase which has become current in another sphere, may be called the "Big Four." The production to-day from the alluvial diggings within the Union averages about £300,000 per month, and this will give you some idea of the enormous advantages which the alluvial diggers derive from the policy of control. Their conditions of living have improved, their prospects brightened, and the large numbers of families who formerly eked out a miserable pittance owing to the low prices realised for their finds are now making comfortable livings, and some diggers are even becoming despised capitalists. (Laughter.) A wonderful change for the better has come over the whole of the diggings, which is beneficial to the State in many ways, apart from the revenue received from the 10 per cent. export duty on diamonds found on these fields.

In addition to the increased life of the mines, which results from the policy of control, the State benefits enormously in direct taxation. The conference estimated that the market will absorb annually at least £12,000,000 worth of diamonds that the "Big Four" themselves will produce. On this basis I have made a rough estimate of the annual direct income the State will receive if diamonds retain their present prices. It is not an audited account, but it is, I think, one well within the mark.

The 10 per cent. duty on diamonds exported from the Union will amount to	£1,200,000
From De Beers Company, for normal and dividend taxes (and this is a low estimate)	400,000
Government share of the Premier Company's profits (including normal and dividend taxes)	800,000
From Jagersfontein Company, for normal and dividend taxes	75,000
Making a grand total per annum of	£3,475,000

"TAKING THE CREAM."

The Government will, therefore, receive per annum more in direct taxation from the diamond industry than the three large producers in the Union (namely, De Beers, Premier and Jagersfontein Companies) combined pay annually in dividends on their ordinary shares. This method of taking the cream and leaving the skimmed milk for investors has been adopted by a Government anxious to promote industrial expansion and the introduction of foreign capital for the development of the country and its enormous possibilities. (Applause.)

Speaking of the vital necessity for greatly increased carrying powers of the railways and the widespread agitation for industrial development within the Union, the Chairman said:

MORE CAPITAL FOR DEVELOPMENT.

This is a most laudable movement, with which we are in full sympathy and prepared to supply more capital and devote our energies—a real and practical proof of our desire to further the interests of South Africa.

This company is largely interested in farming—agricultural and pastoral. We possess 450,000 acres of land in the Union, mostly within the Kimberley district, and 250,000 acres in Rhodesia, all of which are beneficially occupied. This will be apparent when I tell you that we have running on those farms 27,180 animals—14,895 in Rhodesia and 12,285 locally. During the last eighteen years we have imported pedigree stock and thoroughbred horses which have materially improved the breed of our animals. During the last financial year we sold by public auction in Rhodesia 1,500 head of cattle, realising £11,300, and it will be necessary to hold auction sales periodically in order to dispose of surplus stock.

It will interest you to learn that on June 30 last the total sum the company had invested in ventures quite apart from diamond mining amounted to £3,147,561, including the following:

Cape Explosives Works	£1,464,878
Cold Storage	332,894
Farms, Tramways, and other property	753,437
Rhodesia	155,954
Rhodes Fruit Farms	95,401
South African Collieries	298,151
Kroonstad Coal Company	46,846

If shareholders had exclusively studied their personal interest they would have insisted on this large sum being distributed in dividends, which would have amounted to £3 per share. To their credit, however, they acquiesced in the Board's policy of utilising a large portion of the company's profits in industries and farming, providing employment for a large number of human beings and furthering the interests of South Africa generally. (Applause.)

Mr Kenneth Quinan, manager of our Explosives Works, who rendered valuable and distinguished services in England during the war, in erecting works, organising staffs, etc., for the manufacture of high grade explosives (and for which he was commended and thanked by the British Government), has consented to take charge and manage all the new works in connection with industrial development which we may decide to inaugurate. Under his capable guidance, and with the aid of his experience, we hope to establish new industries in association with our explosives and coal interests, which should find employment for many workers, and be of benefit to South Africa. Mr. Quinan has already secured the services of several highly-qualified and experienced men as assistants, and the scheme is satisfactorily maturing. The success of the undertakings depend upon our ability to manufacture in competition with imports from overseas. We hope the high price of skilled labour in this country, which is a great factor in working costs, will not prevent the full development of the schemes we have in contemplation in conjunction with Mr. Quinan.

DIAMOND CUTTING.

The question of establishing a cutting and polishing industry in this country has been ventilated and discussed for some years, but nothing has been done even by the loudest and strongest of its advocates. Speaking for the company, as producers having to find money for wages, mining supplies, railway rates, etc., we are compelled to sell our diamonds for immediate cash, and therefore cannot embark on an undertaking necessitating long-term credits, as is customary in the polished trade. Moreover, we are far distant from the recognised markets for brilliants. We sell all our rough diamonds in Kimberley, cash against delivery, and it would be very risky if we ventured upon an industry that would deprive us of a portion of our ready money sales. It should also be remembered that the management of an up-to-date cutting factory requires a highly-qualified and experienced staff to properly and successfully supervise the work, which is very technical, and in the case of expensive and irregular shape stones is of a most difficult and delicate nature. We are, therefore, not prepared to establish a cutting factory in connection with our mining operations. The producers of wool, whose industry is much older than ours, have not manufactured cloth; in fact, nearly all raw materials and ores grown or won in this country are exported to the best of the world's markets. We claim the same right to realise our product to the greatest advantage. We receive no consideration from the Government; on the contrary, our shareholders are more highly taxed than those interested in any other business or investment.

A HIGHLY TAXED INDUSTRY.

Scarcely a year passes without extra burdens being placed on the diamond mines in the form of additional taxation; yet we are expected to establish and carry on a venture which may react detrimentally upon this company, although the demand for brilliants in this country does not amount to £100,000 per annum.

However, the company has decided to erect in Kimberley a cutting factory, equipped with electric power, containing one hundred mills. These will be let to approved persons on very reasonable terms to encourage them to cut and polish diamonds. I may inform you that the Diamond Syndicate is quite prepared to assist by influencing important manufacturers to transfer a portion of their work to South Africa. The difficulty of establishing polishing here, is, however, increased by the reported action of the Guilds in Amsterdam and Antwerp, who have prohibited their members from working at their trade in South Africa, as they are anxious and appear determined to retain for their own country an industry which has existed there for centuries. Whether these difficulties can be overcome remains to be seen. Be that at is may, the opportunity for making brilliants here will be provided by De Beers. What the outcome will be is for the future to disclose.

The Chairman further stated that the company had decided to assist their workpeople to become their own landlords, and had evolved a scheme which would enable them to possess their own dwellings on a system of monthly payments which would not exceed the rents that many are paying for houses probably inferior to those that can be built with the company's financial assistance.

New Companies.

New Gloria Asbestos, Ltd., Aegis Buildings, corner of Loveday and Fox Streets, Johannesburg; capital £35,000.
Harry Gordon, Ltd., 19 Fraser Street, Johannesburg; capital £5,000.
Wilson & Davis, Ltd., 12 Simmonds Street, Johannesburg; capital £5,000.
East Witpoortje Gold Mining Company, Ltd., 169 Stock Exchange Buildings, Johannesburg; capital £11,000.
Pioneer Investments, Ltd., Kimberley-Booysens Road, Ophirton, Johannesburg; capital £2,250.
The Vaalbank Farming Company, Ltd., P.O. Corner Building, Rissik Street, Johannesburg; capital £250.
The Swahili Trading Company, Ltd., 119 and 120 Stock Exchange Buildings, Johannesburg; capital £500.
J. P. Stark & Co., Ltd., Market Square, Springs; capital £600.
Transvaal Canning Company, Ltd., 1 and 2 Trust Buildings, Fox Street, Johannesburg; capital £10.000.
The Beaufort Supply Stores, Ltd., 11 Bezuidenhout Street, Troyeville, Johannesburg; capital £1.400.

FOREIGN COMPANY.

Abbeville Gold Mines, Ltd., care R. B. Saner, 12, 13 and 14 Grosvenor Chambers, Loveday Street, Johannesburg; capital £120,000.

Mashonaland Railway.

The ordinary general meeting of the Mashonaland Railway Co. Ltd., was held at 2 London Wall Buildings. Mr. Rochfort Maguire presided, and, in moving the adoption of the report and accounts, said the most noticeable feathres of the working results of the railways were the continued decline in the gross revenue and net earnings of the Beira Salisbury line and the improvement in those of the Kalomo-Broken Hill section. With regard to the Beira-Salisbury line, there was a fall of £40,381 in the revenue from general merchandise, while there were satisfactory increases in the revenue from mineral and livestock traffic, but the net result was a fall in gross revenue of £13,007, and the working expenditure had increased by £33,353, with the result that the net earnings were reduced by £46,360. This was partly due to the disorganisation of traffic caused by floods, but the continued decrease in the volume of general merchandise had been a marked characteristic of the War years. The matter was receiving the close attention of the board, but it was obvious that no remedy would be effective until shipping conditions improved. The figures for the Kalomo-Broken Hill section showed increases in gross revenue and net earnings, the latter amounting to over £200.000. The report was adopted.

The Colour Bar.

Before the Low-Grade Mines Commission, Mr. W. Stuart, M.L.A. for Tembuland, submitted a statement condemning the colour bar in unmeasured terms. He said, among other things, that from the point of view of the League of Nations it constituted a breach of the Peace Treaty. Mr. Stuart submitted that the abolition of the regulations upon which the colour bar depended should take place at once; that was an unalterable opinion. Such abolition would not come because it was an inherent necessity, but to save the low-grade mines with a grudging consent from the white labour group. Was there a *via media?* He thought so. The colour bar preserved the white artisan of Johannesburg from competition, kept up his wages, increased his importance and his danger to the State, creating a huge and profiteering class of white overseers. Such men laboured by sitting still and were the bourgeoisie of labour. He thought the colour bar from the point of view of the State was a colossal and cramping extravagance. From the point of view of coloured people it was an injustice, and from the white miner's point of view it was a privilege—a caste perquisite filched by a group of nouveau aristocrats—the aristocracy of the Syndicalistic strike plus the lottery ticket—a monster of anti-democratic savagery.

MINING INSTITUTE.
Certificates for Managers, Overseers, Surveyors.

RESULTS.—42 Managers' Certificates out of 55 in S.A., and 36 Overseers' Certificates in a recent 12 months; 15 Managers' Certificates (1 conditional) to date (1919) and only one failure in the Overseers' Examination in the last four months.

Greatly reduced fees. Survey Class just started. Overseers' Class may be joined at any time. Reef Classes where desired.
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Company Meetings.

NEW MODDER.

There was a large attendance at the annual meeting of shareholders of the New Modderfontein G.M. Co., held on December 9th, in the board room, Corner House. Sir Evelyn Wallers presided, and there were 116,764 shares represented out of an issue of 350,000.

The chairman in moving the adoption of the report and accounts said:

The report and accounts for the year ended 30th June last, have been in your hands for some time and you will have made yourself thoroughly familiar with the position of your Company there set forth. I will, therefore, be quite brief in touching on one or two features of the year's work.

As you will have observed, the coming into operation of the new Main Winding Plant and the new Reduction Plant resulted in a considerable increase in the tonnage treated, with a resultant increase in the profit earned. Unfortunately the native labour supply throughout the year has been disappointing and we have not been able to use our plants to their full capacity. On the average we have had only, approximately, 75 per cent. of our complement of native workmen, and we have had, therefore, to concentrate our underground operations in the most convenient points in order to make the best use of that labour. We have, as you know, spent very large sums of money on various mechanical arrangements underground to obtain the best efficiency possible. Practically every ton of ore is broken by machines, and mechanical devices for handling that ore have been instituted wherever possible. We can, therefore, I think, be satisfied that, technically, the utmost use is being made of the labour force at our disposal, and any small addition to it is at once reflected in both output and profit.

Milling and Profit.

The year's operations resulted in a working profit of £1,089,891 from 920,500 tons milled having an average yield of 43s. 10d., with working costs at 20s. 2d. I need not give details of the distribution of this profit because very full particulars are given to you in the annual reports which have already received your consideration. The dividends paid during the year amounted to £875,000; direct taxation to the Governments amounted to no less than £215,000 and the balance unappropriated brought forward on the 1st July last, amounted to £255,866 19s.

As regards the development work carried out for the year under review, you will have realised that the inadequate native labour force prevented us from doing quite as much as we should have desired. In point of fact, however, our ore reserves at 8,854,000 tons were practically maintained, and that is really all that is necessary in view of our exceptionally strong position in this respect.

The footage effected for the year was 9,477, of which about 4,000 feet consisted of main haulages, crosscuts, etc., in existing reserve blocks, carried out in order to make more accessible and economical to work. The value of the new reef disclosures were very satisfactory, with a high degree of payability, but otherwise there were no special points of interest beyond those with which I have made you familiar from year to year. The testing of the upper leaders in the central portion of the mine continued as circumstances permitted, and there is no doubt that their existence in certain sections very appreciably increases the productivity of the claims in those areas. Since the close of the financial year we have been able to slightly increase our development work and excellent values have been disclosed.

The Development.

The following position as regards the developed and undeveloped areas of your property as at the 30th June last will be of interest. Of the 1,265 reef-bearing claims, 270 have been worked out, and the ore reserve covers 281½ claims. The accumulated unpayable area covers 96 claims, the undeveloped area comprises 613 claims, and the balance, 4½ claims, is allowed for dykes and faulted ground—a particularly small proportion.

The indications as to the value of your undeveloped area are of a very satisfactory nature, having regard to the data available from other surrounding properties. On the eastern side you have the richest developed portion of the Modderfontein "B," on the western side you have the similar very satisfactory conditions of the Van Ryn Deep, and on the south your neighbour is the Modderfontein Deep Levels, Ltd. So far, therefore, as the probable value of the remainder of your ground is concerned, you could not very well be better situated.

The details of the capital expenditure for the year under review are given in the reports, and, as you will see, were mainly concerned with the completion of the new plant. The commitments for the current year on capital account are not large, and consist principally of another 65-drill air compressor, which we must obtain, and the erection, when possible, of four additional batteries of Nissen stamps, with the necessary small additions to the cyanide plant. The expenditure in this connection is estimated at £27,000 approximately, which will have the effect, when the work is completed, of increasing the capacity of the plant by a further 10,000 tons per month.

November Profit.

Current operations to date, since the close of your financial year, have continued to be satisfactory, and with a little improvement in the native labour force the profit for November was £95,000. You will also bear in mind that all gold shipped from South Africa since July 25th last comes under the new arrangements for the sale of our product, which has resulted very satisfactorily, and that the profits declared have not included the premium that has been obtained. We cannot give you to-day the definite figures, but I think you can safely estimate that the premium on gold sold up to date has averaged 17 per cent., and, taking this figure, it means an additional profit to your Company, up to the end of last month, of, approximately, £121,000. You will be familiar with the abnormal world conditions which have resulted in this premium on gold, and I am not going to attempt to prophesy as to the time during which similar conditions are likely to prevail. In the meantime you are receiving a higher price for your product; do not forget, however, that higher costs are also indicated by prevailing conditions. The half-yearly dividend will be declared shortly, and I think the position of your Company justifies a distribution of 30s. per share.

Enemy Held Shares.

As regards the enemy held shares in our Company that are vested in the Custodian, we endeavoured over a considerable period, but unsuccessfully, to negotiate with the Government of the Union of South Africa for their purchase, on the same basis as was successful in respect of the Modder Deep, with the view of offering them pro rata to existing shareholders of the Company. During the last few months, we are informed, that Government has been re-considering the position generally, in regard to enemy held property, and are, therefore, not in a position to negotiate with us. They have, however, promised to inform us when they have formulated their policy in this connection, and, if we are in a position to do so, we shall again take up negotiations with them. The question of splitting the existing £4 shares of your Company into eight 10s. shares will be dealt with at the Extraordinary General Meeting to be held immediately on the conclusion of this meeting. Your thanks are again due to the General Manager, Mr. Miles Sharp, and the officials and workmen of the mine who have all contributed to a very satisfactory year's results. Your Consulting Engineer, Mr. H. Stuart Martin, continues his able technical guidance of your Company's affairs.

Mr. S. C. Black seconded, and the report and accounts were unanimously adopted.

The retiring directors, Major R. W. Ffennell and W. T. Graham were re-elected, and Messrs. C. L. Andersson and Co. and Messrs. Deloitte, Plender, Griffiths, Annan and Co., were reappointed auditors, with remuneration of 350 guineas each for the past audit.

Splitting Up Shares.

At a subsequent extraordinary general meeting it was unanimously decided that each of the existing £4 shares be divided into eight 10s. shares, upon each of which the sum of 10s shall be credited as paid up; that the certificates of shares and share warrants be called in by the directors and cancelled, and that in substitution therefor new certificates and share warrants be issued, subject to the provisions contained in the Company's articles of association.

MODDER EASTS.

Mr. Max Honnet presided at the annual meeting of shareholders of the Modderfontein East, Ltd., held at 2.30 p.m. on December 9th, in the board room, Corner House. There was a large attendance.

The Chairman, in moving the adoption of the report and accounts said: Since I last addressed you at the special general meeting held in May, the annual reports and accounts for the year ended 30th June, 1919, have been issued. These amplified the information given in May to the extent of about two months' work, and the reports of the consulting engineer and manager not only set out in great detail the results of the whole year's operations, but also summarise the work done on the property since the inception of the company. You have no doubt carefully examined the figures of development in conjunction with the larger scale plan of the mine which is now issued with the report, and there is no necessity for me to cover the ground again, especially as you have since received a further detailed report for the quarter ended 30th September, 1919.

When last we met on the 15th May practically all the development accomplished up to that time had been in the Cloverfield section of the property, only a very small distance of reef-bearing ground having been opened up at No. 3 shaft. Between that date and the close of the financial year the reef had been intersected in No. 2 shaft and quite a substantial amount of development work had been done in No. 3 and No. 1 shafts, and the calculation made at the end of June showed that the tonnage of ore developed had increased to the satisfactory figure of 850,000 tons of an estimated value of 8 dwts.

Footage Development.

The total linear footage carried out during the financial year was 18,139 feet, of which 978 feet consisted of vertical shaft sinking, principally in the completion of No. 2 shaft. The results obtained in the form of reef disclosures were encouraging—the more so as they showed progressive improvement in value quarter by quarter; thus the first quarter of the year gave an overall average of 262 inch dwts. for 2.637 feet sampled, and the last quarter 344 inch dwts. for 3.455 feet. The figures for the intervening periods are shown in the manager's report. Co-incident with this, the percentage of payability remained at a satisfactory level, the percentage from the inception of the company to the close of the last financial year in the Cloverfield section being 47 per cent., averaging 509 inch dwts., and in No. 3 shaft section 61 per cent., averaging 295 inch dwts. At that time the No. 2 shaft had just reached the reef and a small amount of work preparatory to development had been done. During the first three months of the present financial year the development work at all three shafts showed a further gratifying improvement—so much so in fact that it is too much to hope for a continuance of such remarkable results. This will be clear when it is realised that the percentage of payability at No. 1 shaft was 75.5 per cent., averaging 420 inch dwts., as compared with 47 per cent. prior to that quarter, at No. 3 shaft it was 81.3 per cent., averaging 457 inch dwts. compared with 61 per cent., while No. 2 shaft for that quarter showed 100 per cent. payable, at a value of 529 inch dwts. and you will be glad to hear has continued so right up to the present date. On the other hand, the results since the end of September at Nos. 3 and 1. though by no means unsatisfactory, have been somewhat poorer than those disclosed during the previous quarter.

Company's Finances.

Turning now to the finances of the company, you will remember that our original cash resources ran out during November, 1918, and that from that time onwards we had to rely on the assistance of the Central Mining and Investment Corporation and associates for funds with which to carry on the development of the mine, which they advanced on loan at 6½ per cent. interest. Then in May last you empowered the directors to issue debentures to an amount of £500,000 upon certain terms and conditions. By virtue of this authority, an issue of £200,000 of debentures was made in June last, of which the shareholders subscribed £159,055, and the balance of £40,945 were taken up by the guarantors of the issue. We thus became possessed of £200,000 shortly before the close of the past financial year, out of which we immediately repaid the loan from the Central Mining, which in total amounted to £145,000, and our position at 30th June is reflected in the balance sheet before you.

Year's Expenditure.

You will see that the expenditure for the year under review totalled £269.094 1s. 6d. Of this amount, the major portion, viz., £237,006 0s. 10d., was spent upon equipment and development of the property, as shown in the schedule attached to the acting manager's report, and the balance of £31,998 0s. 8d., was absorbed by general expenses at the mine and head office (after allowing for sundry revenue), as shown in the balance sheet. At the end of the year the total amount spent on the property was £508,233, and the excess of receipts over expenditure since the inception of the company amounted to £62,391 18s 5d., represented by cash and cash assets, less liabilities (excluding the debenture liability). the net amount of cash on hand then being £38.606 0s 6d. This cash carried us on until towards the end of August last, when we had again to approach the Central Mining and Investment Corporation for financial assistance, pending the issue of further debentures. The second issue of £300,000 was offered for subscription in October and was taken up by the holders of the first issue, under their preferent right, with the exception of £810 of debentures, which were sold on behalf of the company in the open market. The £300.000 thus accruing enabled us once more to liquidate our indebtedness to the Central Mining and Investment Corporation, on which interest had been charged at the rate of 6½ per cent. per annum as before. At the end of November the balance of cash remaining on hand was £201.000, after providing for all liabilities except the outstanding debentures of £500.000. Shareholders, I think, have reason to be well satisfied with the unqualified success of these two debenture issues, which have placed us in the possession of the funds so necessary at this stage for the continuation of our operations. Besides yielding interest at 6½ per cent. per annum, our debentures are convertible into shares at par, and at present they are quoted in the sharemarket at a premium corresponding approximately to the premium on the shares.

Exercise of Options.

The funds now on hand, namely, £201.000, will suffice to meet all our requirements until beyond July next, when the first series of options, known as the three year option, fall due to be exercised. It may be taken for granted, I think, that the total number of shares under option to that date will be called up at the price of 21s. 3d. per share, which will provide the company with a further £397.353. A year later, i.e., on the 1st July, 1921, the four year option expires, and if fully exercised at 22s. 6d. per share will produce further funds to the extent of £420,728. Provided, therefore, that the price of our shares remains at a level somewhat above 22s. 6d. (which, in view of the satisfactory position of the mine should be the case) it is reasonably safe to assume that the company will be placed in possession of further funds to the extent of £818,081 from the exercise of these options during the next 18 months or so. In addition, we shall secure some revenue from the Apex milling scheme, to which I shall refer presently, but it is impossible at this stage to make any forecast of what the revenue from that source will be. On the other hand, we have to provide for our current development, for standing charges, and debenture interest up to 31st July, 1921, apart from which items there is the cost of the proposed reduction plant, with which I shall now deal.

Reduction Plant.

The development position at the mine at the end of the year was such that the Board were of opinion that the time had arrived for considering the erection of a reduction plant, and shareholders were notified in the annual report that steps were being taken to prepare the necessary plans and specifications for a reduction plant of an initial capacity of 40,000 tons per month, to be designed in such a manner as to permit of extension later, if so desired. The excellent development results subsequent to the close of the year served to confirm the opinion of the Board that the ordering of a milling plant was justified, and inquiries were set on foot as regards prices, both in this country and abroad. The reduction plant itself was considered on the model of the 40,000 tons per month unit erected by the New Modderfontein Gold Mining Company during the war period, which has now been operating for about 18 months; and provision was made in the estimates for the accessory requirements of every description, both on the surface and underground, so as to fully equip the property on the basis of milling 40,000 tons per month. It will cause you no surprise, I am sure, if I inform you that the investigations made during the last two or three months by our engineers disclose a most unsatisfactory condition of affairs. In the first instance, we examined the field of second-hand machinery with a view to obtaining as much as possible of the plant required in this country. We discovered that there was not a great deal of material available, and that such items as were available were either unsuitable for a modern type of plant such as we wished to instal, or were only procurable at such enhanced prices that, when the additional cost of dismantling, transport and re-erection were added, these items became in most cases just as expensive as, if not more so, than the imported article. We therefore came to the conclusion that, although some minor portions of the requirements could no doubt be secured in this country, we would have to rely upon importation for the bulk of the material and machinery.

Not Yet Justified.

Our inquiries in Great Britain and America have revealed a state of affairs under which it is practically impossible to consider the ordering of the plant at the present time. The quotations received from manufacturers in these two countries showed enormous increases over the prices prevailing before, and even during, the war; moreover, manufacturers would not bind themselves for any length of time to the prices quoted, which are still on the up grade, nor would they agree to any fixed date for delivery. The position, therefore, as we found it was that we not only had to face an enormous expenditure at the prices actually quoted, but had to be prepared to see these prices put up against us still further, in addition to which we had no certainty, even approximate, as to when we should get delivery of any articles ordered. The net result, then, of our investigations into this matter is that the price of our proposed reduction plant, together with all accessory equipment above and below ground, comes out at an enormous figure. The board has given this matter very serious consideration, and have reluctantly been forced to the conclusion that the expenditure of the sum of money involved is not justified. Having regard to the favourable position of the mine, the erection of a reduction plant is undoubtedly warranted, and I can assure you that your board expected and were willing to pay a pretty stiff price in order to bring the mine to a producing stage on a large scale as soon as possible. But having fully investigated the position they are not prepared, in face of the estimates placed before them, to recommend that the ordering of the reduction plant be proceeded with under present circumstances; and they, therefore, propose to defer the ordering of the plant for the time being. We think it is better to mark time and take stock of the whole situation. I would like shareholders to understand very clearly that our decision merely amounts to a temporary postponement of the ordering of the plant. We shall not for one moment abate our efforts to secure the plant at the earliest possible date, but we conceive it to be our clear duty to endeavour to procure it at a more reasonable price, and not to cripple the company by saddling it with the enormous capital expenditure involved in purchasing a plant at the existing inflated prices of material and machinery. Some delay will do us no harm .Possibly during the next year or two the prices of machinery and materials may come down to reasonable levels—we sincerely hope they will, for if they do not it seems inevitable that new industries in this country, or the expansion of existing industries, will be seriously retarded. During the intervening period we shall simply press on with our development work, with the object of placing the mine in a good position to supply ore; and in this connection I may say that it will be necessary in any case for us to spend a good deal of money in order to enable the mine to continue development work upon the extended scale, by the provision of such items, for instance, as additional air compressor plant, pumping installation, housing accommodation, etc., all of which are urgently required, and also upon the equipment necessary to transform the mine from the developing to he producing stage, which it will enter within the next few months, when the arrangements for crushing at the Apex plant have been completed.

Lease from New Apex.

As a set off to the disappointment which shareholders will no doubt feel at the statement I have just made regarding our own reduction plant, I am very pleased to inform you that, after a good deal of negotiation, satisfactory arrangements have been concluded within the last few days with the New Kleinfontein Company for a lease of that portion of their reduction plant known as the Apex section, which ceased operations at the end of July last. We were indeed fortunate in being able to conclude this arrangement, which we regard as one of considerable advantage to the Modder East at this stage—particularly so under the circumstances I have just detailed. As you know, we have already accumulated an important tonnage of development ore on the surface, to which we are adding daily from current development work. The whole quantity constitutes an asset which in the ordinary course of events would no doubt eventually be realised, but which, under this Apex arrangement, becomes of immediate value—a value which wou will realise is further enhanced by the prevailing premium on the price of gold.

As this project, I believe, is somewhat of an innovation, at all events so far as these fields are concerned, you may be interested in a general outline of the modus operandi. The current ore from development faces from all three of our shafts will be concentrated at a rough sorting floor at No. I shaft, where a storage bin will be erected to deliver into railway trucks, which will reach this point by means of a short railway siding between the Geduld Station and No. 1 Shaft. Satisfactory arrangements have been made with the S.A.R. Authorities for transport of the ore from there to the Kleinfontein Station—a distance of about seven miles. The haulage from this point to the Apex collecting bins will be carried out by the locomotives of the New Kleinfontein Company, Limited, and the milling of the ore in the plant will be conducted under the supervision and control of our technical officials. Being in the nature of an experiment, as I have said, and as the success and eventual magnitude of the operations are largely dependent upon the supply of railway trucks—upon which latter point, however, we have received assurances of sympathetic treatment it will be apparent to you that I am not in a position to make any forecast as to the probable results. I may say, however, that our engineers are very confident that this project will be of great benefit to the company, not only on account of the revenue to be derived but also on account of the technical knowledge which will be gained as to the best method of treatment of our ore. It is not often that Metallurgists have an opportunity of working a large scale test of the ore to be treated before they are called upon to finally decide on the design of the plant.

Milling Policy.

The capacity of the Apex plant is rated at 27,000 tons per month. In the first instance we shall supply the mill with the whole of the ore from current development, together with as much more from the accumulated dumps as can be handled. About the middle of next year it is hoped that at least two (if not all three) of the shafts at the Modder East will be connected, whereupon it will be possible to increase the scale of operations, and when this stage is reached, provided no difficulty arises in securing the requisite labour it will naturally be our object to fill the Apex plant to its full capacity—which I may remind you is equivalent to nearly 70 per cent., of the scale of operations we have in view for our own plant when erected. You will see, therefore, gentlemen, that if we suffered some disappointment in the postponement of our own plant, we have at all events secured a very satisfactory substitute, which will be in operation about two years earlier than could possibly have been the case with our own plant; and if we can fill the Apex plant, say, towards the end of next year, we shall by this scheme have brought the Modder East to the producing stage on a fairly large scale at a date which a few months ago we would not have dared to contemplate.

I should like to make it quite clear that the revenue accruing from these operations in the first instance—that is, while the tonnage milled is derived from development rock entirely—cannot be regarded as profit, but must rather be looked at as representing a return of some portion of the money previously sunk in development work.

Before leaving this subject, I wish to point out also that the expense involved in carrying out this scheme is quite moderate, and that the greater portion thereof will be incurred upon work which, though adaptable to this project, nevertheless forms part of the general installation we have in mind for our own larger plant when eventually erected.

Now, gentlemen, the reports and accounts before you contain the fullest information in regard to the past year's work, and I do not think there is any other point I need refer to. In moving the adoption of these reports and accounts, which I now beg to do, I think I may say with some justification that we have every reason to be satisfied with our prospects—that is, if our present position may be taken as an indication for the future. Not only has our mine been opened up very rapidly with satisfactory results, but we are on the eve at this early date—of realising the aim and object of every gold mining proposition, namely, the production of gold. For this state of affairs we are much indebted to Mr. H. Stuart Martin, our consulting engineer, and Mr. H. Meyer, who is now acting in his absence; to Mr. Coe, the manager of the mine, and to the other officials of the company, all of whom have rendered excellent services.

Mr. Emil Lewin suggested that an effort should be made to get the reduction plant in Germany where, he said, great benefit would be gained owing to the difference in exchange in our favour.

The Chairman replied that inquiries were made in the two markets which seemed to be most readily available. Germany had not, he said, entered into their calculations. They might consider the matter, but their inquiries were confined to South Africa, Great Britain and America.

The report and accounts were unanimously adopted.

Messrs. H. C. Boyd and E. H. Read, retiring directors, were re-elected. Messrs. H. G. L. Panchaud and J. D. H. Lang were reappointed auditors.

NOURSE MINES.

At the annual meeting of shareholders of Nourse Mines, Ltd., held at 11 a.m. on Dec. 9, in the board room, Corner House, the Chairman, Mr. H. C. Boyd, who presided, in moving the adoption of the report and accounts said: Unfortunately a far from satisfactory position is reflected in the report and accounts for the year ended 30th June last, which we are met to-day to consider. Quite apart from the months directly affected by the influenza epidemic, when the tonnage milled was greatly reduced and serious loss was incurred, the amount of ore milled throughout the year was once more greatly below the capacity of the plant. The mine, with numerous points of attack available, was and is capable of supplying the required tonnage, but the labour force, although greater than during the preceding year, remained throughout quite inadeuate for our requirements, while the fluctuations in the numbers told seriously against efficiency. As is mentioned in the Consulting Engineer's report, the native complement of our mine is 5,446, whereas the average number of natives employed during the year was only 3,850; in January actually only 3,258 were available. Similar conditions obtain to-day. At the end of last month 3,654 natives were in our employment, and it must be realised that so long as we are only in a position to mill in the neighbourhood of 40,000 tons monthly, the margin of profit, even at the present price of gold, must remain but small.

More Jack Hammers.

It would appear that under existing conditions the only way to increase the tonnage is to instal further jack hammers. and we propose to do this in spite of the considerable expense involved. Last year the recovery was some 27s. 1d. per ton, but costs rose to 26s. 7d., working expenditure having been increased by over £50,000, although, as compared with the previous year, some 13,000 fewer tons were milled; 4-5ths of this increased expenditure was due to the enhanced price of stores and higher wages paid to white employes. The ill effects have been seriously felt of the reduced working hours now in vogue, and of the waste of natives' time underground caused by certain mining regulations, which we feel might well be modified with benefit to all concerned. Evidence on this latter point was given before the Low Grade Mines' Commission now sitting.

The net profit for the year was only £15,393, a truly deplorable result from the production of £620,000 of gold. Naturally no dividend was declared, and this profit was carried to Appropriation Account, which further benefited by the credit on Capital Account of about £8,500 mainly arising from sales of redundant plant, and at the close of the year showed a credit balance of £155,337, of which the net cash and investments were £92,427

The Manager's report deals fully with past year's operations. Over 15,000 feet of development work was accomplished—a creditable performance under the circumstances. This was mainly in the South Nourse Section, and disclosed 310,300 tons of payable ore of an estimated value of 7.1 dwts. per ton, or about [illegible] dwt. lower than the payable ore developed during the previous year. Taken as a whole there was no marked change in the position of the mine, and the ore reserves at 30th June last, were returned as 1,526,100 tons of a value of 6·8 dwts. per ton an increase of some 13,000 tons, with no change in value.

Capital Commitments.

As is mentioned in the Directors' report the development of the South Eastern Section of the mine, through the old South Nourse No. 1 shaft, which is to be sunk a further 1,000 feet, is in hand. It is estimated that, allowing for plant, which will be released for sale, a net expenditure on capital account of £55,000 will thus be incurred during the next two years. This necessary work for the opening up of this part of the mine is proceeding satisfactorily, both on the surface and underground, where 120 feet have so far been sunk. On completion of the scheme, concentration of the hoisting operations will follow, and appreciable economies should result therefrom.

During the current year the tonnage milled has continued low, and costs have remained much the same as those of last year; it is to be noted that under the New Miners' Phthisis Act our assessment has now risen from £558 to £1,877 monthly. Recovery has been appreciably lower than that of last year in spite of efforts to improve it, and is now the subject of special investigation at the mine. There was some change for the better in this respect toward the end of last month. Development values remain generally unchanged, with more encouraging disclosures in the eastern section of the mine. The published profits for the first five months of this financial year, which, as has been announced, take no account of the increased price for gold now obtainable, indicate a loss of some £8,120, but actually we may now reckon on a profit of about £30,000 for the period, calculated on the basis of an average premium of 17 per cent; allowing, that is, for the cost of realising. In connection with the South Nourse development scheme, £28,485 had been spent to the end of last month, while £21,882 had been realised from the sale of old plant, making a net debit to capital account of £6,603. It is probable that the Board, taking everything into consideration, will decide to declare a small dividend for the half-year of 2½ per cent. The Directors desire to record their appreciation of the efforts of the Consulting Engineer, Manager and staff generally in the face of considerable discouragement.

The report and accounts were adopted unanimously.

Messrs. E. J. Renaud and H. Nourse were re-elected Directors, and the Auditors, Messrs. H. J. Lamb and C. L. Andersson and Co., were re-appointed.

TRANSVAAL AND DELAGOA BAY COLLIERIES.

The ordinary annual general meeting of the Transvaal and Delagoa Bay Investment Co., Ltd., was held on December 9th in the board room Transvaal Gold Fields Buildings, Johannesburg. Mr. S. C. Black presided, and there were represented personally and by proxy 103,486 shares out of a capital of £185,000. The Chairman said: Gentlemen,—In submitting the report and statement of accounts for your adoption, I am pleased to say that we can look back on a successful year. The realised net profit, after writing off £8,215 13s. 2d. for depreciation, and making provision for the income and other taxes, amounts to £82,357 8s. 2d.; we brought forward from last year, £45,019 7s., making a total to credit of profit and loss account of £127,376 15s. 2d. The year's profit shows a slight increase despite the fact that the profit from our collieries was affected by higher working costs, to which I shall allude later on. The decrease from the latter was not serious, and is more than counterbalanced from other sources. The financial position of your company remains strong, cash and equivalent assets, less creditors, amounting to £152,601 3s. 3d. and being represented chiefly by cash, Union of South Africa stock and British Treasury Bills and War Loan. I need not go into the details of the balance sheet as everything is set out clearly and concisely, but I wish to direct your attention to "sundry shares." Although we disposed of some shares advantageously, this item shows the substantial increase of £71,617 as compared with last year, and is accounted for by our purchase of the Douglas Colliery, Ltd. To be precise, we acquired 174,250 £1 shares out of a total issue of £175,000, and we are thus in absolute control of this company's affairs. I have no hesitation in describing this transaction as very advantageous and likely to prove of considerable benefit to your company. You will be interested to learn that the Douglas Colliery has, besides some freehold property, £43,190 cash, and certain machinery and plant; the latter is being realised gradually. It also owns a colliery which has been worked for a good many years at little or no profit, and which is now approaching exhaustion. In these circumstances the shareholders wisely decided on selling, while we readily availed ourselves of the opportunity of buying their shares, since we have the facility of turning the holding to good account. By transferring the Douglas output to our own collieries, we are in the position of keeping our plants more fully employed, and by thus concentrating the combined production at one colliery, we are able to effect substantial economies in working costs. The Douglas Colliery continues to exist as a separate company, and as such, receives adequate payment in respect of its share in our output. I may take this opportunity of expressing the board's appreciation of your constant support of our policy to build up and strengthen the company's financial position, which is again seen to bear good fruit, as without ample cash resources we could not have done this business so promptly, or it might not even have come our way at all.

Total of 807,500 Tons.

The Transvaal and Delagoa Bay Collieries have experienced a satisfactory year. The output totalled 807,500 tons, as compared with 757,709 tons in the previous year. Our record output in any one month was 79,450 tons, and I am pleased to add that this figure has already been exceeded this year. Railway truckage has been more regular in supply for some time past, and credit is due to the S.A. Railways Administration for their efforts in this direction. You will have observed from the directors' report that a further sum of £15,000 is provided for additional electrical and power installation, and we also require a few more cottages for married employes. During the war, many things remained unavoidably in abeyance owing to unprocurability of material, but now we have already under order and shall obtain what is required as soon as possible. Whilst our coal output increased appreciably during the period under review, the profit, as already stated, was lower. This is due to the rise in white wages, war bonuses, shorter working hours, higher prices of stores and materials, etc.

The Associated Collieries of the Transvaal have discountenanced any sort of profiteering, and to-day the price of coal is probably lower here than anywhere else in the world. We have on the whole been fairly free in South Africa from serious industrial unrest during the past year. That was due chiefly to the spirit of mutual goodwill between the leaders of the various trade unions and the employers. Much, of course, was done by the latter to redress the higher costs of living and satisfy the reasonable demands of labour by the payment of improved wages, war and other allowances, but of course there are limits beyond which no industry can go. So far as the Transvaal Collieries were concerned, the workers have shown a praiseworthy desire to maintain the current standard of production. That is a right attitude, and I ungrudgingly accord them the fullest credit for a disposition that has not been so manifest in other parts of the world. The Transvaal Coal Owners' Association, of which your company remains a member, disposed of 6,081,018 tons of coal during the year ended 30th June, 1919, as compared with 6,082,105 tons in the previous year. Probably a larger tonnage would have been dealt with if the shipping position had been normal. But until more vessels are released for general service and new ships are launched, the export of coal from South Africa will be handicapped. In view of the difficulties experienced in this direction, a desire has often been expressed that Government should acquire some cargo boats specially for the transport of coal, thereby not only assisting the coal industry but also augmenting the revenue of the State Railways. At Delagoa Bay we sold a small portion of one of our properties at a fair price. Otherwise our holdings remain unchanged. We adhere to the opinion that Delagoa Bay, possessing a very fine harbour and being the nearest port to the Transvaal, will eventually receive a larger share of trade and participate more fully in South Africa's prosperity.

Landed Interests.

Dealing with your landed interests in the Transvaal, the schedule embodied in the report discloses but little change from that issued last year. A few farms were bought and sold. In the course of the year's business we often acquire options on farms, but we make it a practice not to include these in the schedule of our properties, as they may be abandoned after investigation. You will, I am sure, appreciate our reasons for omitting them until such time as they become of sufficient importance to warrant their inclusion in the list. The industrial outlook in South Africa generally appears to me to be encouraging in practically all directions, and agriculture especially is making good progress. The gold mining industry has, however, suffered during the last five years from difficulties not sufficiently appreciated and often not fully understood. In particular has the position of the low-grade gold mines been commonly treated as a matter with which the rest of South Africa has little or no concern, yet their disappearance as gold producers would seriously affect labour, agriculture, commerce and all industries. The collieries did what was within their power to assist these struggling mines by supplying them with coal at pre-war prices, and it is to be hoped that additional relief will be afforded to them in other directions; the higher price now obtainable for gold cannot be relied upon for an indefinite period, and it is essential that working costs should be substantially reduced. Before resuming my seat, I desire to express the board's warm appreciation of the services of the general manager of your collieries, Mr. James McPhee, M.Sc., M.E., who has given unremitting attention to the company's work. To the officials and workmen at the collieries we also tender our acknowledgments, and our thanks are likewise due to the secretaries and staff in Johannesburg and London, and our agents at Delagoa Bay. I now beg to move that the directors' report, balance sheet and profit and loss account for the year ended 31st August, 1919, be received and adopted.

The report and accounts were adopted.

A tribute was paid to the work of the directors, who were all re-elected. Messrs. E. Danckwerts and Co. were re-appointed auditors. A bonus to bring the fees of the directors up to £1,000 was voted.

CONSOLIDATED MAIN REEF.

Mr. Max Honnet, chairman of the Consolidated Main Reef in presiding at the annual meeting of shareholders on Nov. 27, said the accounts dealt with the year ending on June 30th. The working costs had averaged 26s. 2.5d. per ton milled, and which for the four succeeding months had risen still further to 27s. 1.7d. Additional development, as the consulting engineer pointed out in his report was responsible for some portion of the increase last year, and, of course, we suffered in common with all other mines on these fields from the continued heavy rise in the cost of stores and materials, and of white labour. But, continued the chairman, I wish to emphasise another factor mentioned by the consulting engineer, which is the root of the trouble in our case, and that is the narrowness of the reef we have to deal with. The average width of the main reef leader, which is the reef upon which our work is almost entirely centred, is about nine inches, and you will realise that, notwithstanding every effort to keep the stoping width as low as possible by the maximum use of hand labour and small machine drills, a disproportionate amount of waste rock and ore carrying insufficient value to warrant crushing must necessarily be broken—only to be discarded. - During the year under review no less than 226,000 tons were so eliminated, while the ore sent to the mill amounted to just over 571.000 tons that is, nearly 30 per cent. of the total was rejected. and about half of this was stored in the mine for use in support of the workings. This process, of course, results in our getting a higher grade in the mill, but its effect should be borne in mind by those who may consider the costs per ton to be on the high side.

Mainstay of the Mine.

The stretch in the centre of the property—i.e., the western part of the Consolidated Main Reef area and the eastern part of the Main Reef West area—has been the mainstay of the mine, and most of the development work has been done in this portion. Unfortunately, during the year under review, the development work did not give such good results as had formerly been obtained, and this is reflected in the reduction of about 225.000 tons in the ore reserve. This state of affairs has given your board a good deal of anxiety, and they have realised that the only remedy lies in increasing the development programme. Steps to this end were taken during the year under review, and, in spite of an insufficiency of native labour, the programme of extended development was pushed, and has been continued into the current year, the total footage for the last four months having amounted to 9,104 feet as against a total of 15,798 feet for the whole of the previous year. Unfortunately I am not able to tell you that the results during these four months have shown any improvement in position as regards the payability of the central portion of the property.

A Frank Statement.

The chairman next explained that the higher percentage shown in hte manager's report was due to the fact that most of the development work had been done on the more promising areas. He referred to the consulting engineer's warning that the unsatisfactory values disclosed were giving some anxiety, but said that the financial resources of the company enabled them to face the position in respect of development with some degree of confidence. Proceeding, he said: The last thing I wish to do is to frighten shareholders unnecessarily, but I feel it incumbent upon me, as the spokesman of the board, to place the position before you quite frankly as the board sees it. I have attempted to do so, and have dealt with the facts as disclosed by the work carried on at the mine; that is all one can do, and I make no pretence of being able to tell you what may happen in the unexplored areas in the future. Fortunately, as I have indicated, we will be in a position to carry on our development work and thus give our unexplored areas a fair chance; time alone will show whether the expenditure of our money and labour upon these areas will result in the discovery of a satisfactory percentage of payable tonnages or not.

Having dealt with the progress made with the reorganisation scheme for operating the two mines as a more compact unit, he said: Most of the work in connection with the rearrangement of the reduction plant has been completed, and the main portion has been put into operation. It is satisfactory to note that, as a result of this, there has been an improvement in the recovery amounting to about 4d. per ton treated. Work in connection with the concentration of pumping at the No. 3 shaft has been considerably advanced, and this shaft is now handling most of the water from the eastern section. Work is in hand on the scheme for concentrating the water of the Main Reef West section at the No. 5 shaft, and some progress has been made thereon. The pumps and accessories, which constitute the major portion of the expenditure for handling the water at these two shafts, have not yet been obtained; and the payments are thus deferred.

The Dividend.

In the ordinary course of events the dividend would be considered by the Board of Directors about the middle of next month, and as I have not yet consulted them you will understand that the remarks I am about to make on this matter are subject to, and in anticipation of the approval of my colleagues on the Board in due course. Without taking into account the premium on gold, our net earnings for the half-year will be sufficient to pay a dividend of 2½ per cent. In addition we have the premium on gold. Assuming that the full production of three months will have been sold at a net premium of, say, 16 per cent. we will have sufficient further funds on hand to declare an additional 2½ per cent. dividend. The total dividend to be declared about the middle of December will, therefore, I hope, be not less than 5 per cent., after payment of which we will have a balance in hand sufficient to meet the whole of the outstanding capital votes, viz., £78,000; and in addition we will still be due to receive the premium on our gold production of the two remaining months of the half-year, which with the amount we have available on development suspense account, £11,328, I think it would be advisable to retain for future development requirements.

£9,000 Per Month Profit.

The quarterly report for the period ended September 30, which was issued early this month, contains information with regard to our operations since the close of the financial year. The profits to the end of October have averaged over £9 000 per month, and the development footage 2,276 feet per month as against an average 1,316 feet per month for the whole of the previous year. I need say nothing more now except that throughout these four months our supply of native labour has ben far below our requirements.

A question was asked with regard to the fifty shares in the Northern Lime Co. quoted in the financial statement at £47 10s. per share. The Chairman said that the object was to secure the company's requirements of lime. It was considered advisable by the controllers of the group to obtain a control in the supply of such an important item. The vendor company had a small capital.

Regarding the price of gold, the Chairman said that the balance sheet was made up the basis of 84s. per ounce less charges, but the average premium since the free market was established had been 16.8 per cent. The latest sales were at a premium of 20 per cent. in regard to that particular quantity.

The report and accounts were adopted, and the retiring directors—Messrs. M. Honnet, A. A. Auret, F. Raleigh, P. Dreyfus, E. J. Renaud, J. Munro, W. P. Fisher, Sir Evelyn Wallers, K.B.E., Sir Abe Bailey, Bart., K.C.M.G., M.L.A., and Major C. S. Goldman—were re-elected. The auditors—Messrs. Alex. Aiken and Carter and Ferryman and Goldby—were re-appointed.

VEREENIGING ESTATES.

A special general meeting of shareholders of the Vereeniging Estates, Limited, was held at Lewis and Marks' Building, 65 President Street, Johannesburg, on Nov. 29. Mr. Samuel Marks presided, and there were also present or represented by proxy: Messrs. Isaac Lewis, Barnet Lewis, Roy Lewis, Louis Marks, Julius Weil, C. B. Kingston. George Falcke, R. W. Townsend, L. H. Lavenstein, H. J. Dowdall, Henry Lewis, M. D. Harrison, W. H. Bond, A. Hird, G. F. Ayling, Peter Weeks, the African and European Investment Co., Ltd., Theodore Marks, and William Mallinson (secretary). In all 382,361 shares were represented out of an issued capital of 730,580 shares.

The Chairman declared the meeting duly constituted, and the secretary read the notice convening the meeting.

The Chairman said. As you are aware from the notice received by you, this meeting has been specially called for the purpose of considering and, if thought fit, passing a resolution increasing the capital of the company from £730,580 to £1,000,000, by the creation of 269,420 shares of £1 each. The directors have decided to offer the new shares to shareholders in the proportion of one new share for every three shares held. This will absorb 243,527 shares of the 269,420 newly created shares, leaving 25,893 shares in reserve. The African and European Investment Co., Ltd., has undertaken to guarantee the subscription of the new issue at £1 5s. per share for what I think you will agree to be a very low commission of 2½ per cent. The new issue of 243,527 shares at 5s. premium will produce £304,408 The redemption of the existing debentures of £200,000 at £103 per cent. will absorb £206,000, and the 2½ per cent. commission payable to the African and European Investment Co., Ltd., a further £7,610, leaving £90,793 for the general development of the Estate. The clearing of the debenture debt and the consequent removal of the payment of £11,000 interest per annum will place your company in a much more favourable position for the regular payments of dividends. At our ordinary general meeting held in May last I informed you that an electrically-driven saw-mill was about to be erected adjacent to the company's private siding for the purpose of cutting timber from the Maccauvlei Forests on a commercial scale. I am pleased to be able to tell you that the saw-mill and drying shed are both completed. But for the unfortunate strikes in the building trade, this work would have been completed months ago. The machinery is on the spot and is now being erected. The first 20,000 trees, consisting chiefly of pinus insignis and pinus pinaster, have been marked for felling. It is hoped that the first lot of logs will be put through the mill in about two weeks from now. As already mentioned the money available after the redemption of debentures will be devoted to the development of the estate, which will include the extension of your company's own farming operations, the building of a riverside hotel and a boating scheme. While your directors feel sure that the hotel and boating scheme will be revenue producing, it is not so much the direct as the indirect benefit accruing from these ventures that is looked for. Your company, as you are aware, owns over 700 erven in the Vereeniging Township, and the schemes referred to will be the means of bringing an enormous number of visitors into the town who will not be slow in seeing the unique natural advantages of the place. The value of agricultural land in the district has very greatly increased in the past few years. A farm in the district was sold only last week at the price of £4 7s. 6d. per acre, and with very little water on it. It must be left to the shareholders themselves to place a value on the company's land, more especially that portion through which the Vaal River runs, a distance of 50 miles. If this land is so valuable to-day what will it be worth when the Rand Water Board has completed its barrage, which will be in less than 18 months from now? This land offers unbounded possibilities for irrigation purposes, and your company intends to devote a considerable portion of the money about to be raised to this purpose. The company's farming prospects for the current year are particularly bright. Owing to the very large tract of land owned by your company, with its varying soils, and also to the care and forethought in making provision for winter feed, the very severe drought through which we have just passed and which ruined many farmers, left your company unhurt in any way. The wool clip promises to be a good one and with the greatly enhanced price of wool a record price should be obtained. The colliery continues to make good profits and on account of the particularly favourable contract which your company has with the Victoria Falls and Transvaal Power Co., Ltd., for the supply of coal, the increase in wages and the increase in price payable for all stores, leaves it in a most favourable position compared with other collieries. Practically eleven months of the 1919 financial year have gone, and, judging by the progress made during that period, I feel warranted in saying that the balance sheet will vindicate the optimistic view expressed at the last general meeting of shareholders and that the dividend promised will become a fact. By strenuous effort the affairs of your company have been brought to a condition of considerable prosperity, and with the splendid assets which you hold your directors look forward with great assurance to a continuance of that prosperity increasingly in the future. No country has been less adversely affected by the late disastrous war than South Africa, and no town in the Union has greater facilities for industrial development than Vereeniging. The introduction of new industries is a first principle in the policy of your directors, and every encouragement is given for their establishment in the knowledge that by fostering desirable ventures the resources of your company are developed and your company brought to that condition of prosperity so amply justified by its assets. I now beg to move the following resolution: "That the capital of the company be increased from £730,580 to £1,000,000 by the creation of a further 269,420 shares of £1 each, and that the directors be and they are hereby authorised as they in their discretion shall think fit to fix the prices, terms and conditions on which and the rights and privileges subject to which the shares so created shall be issued and to pay commissions and to grant options over the new shares so created or any portion thereof for underwriting and subscribing such additional capital or any portion thereof, or procuring or agreeing to procure subscribers for the whole or any portion thereof."

Mr. Julius Weil seconded the resolution, which was carried unanimously.

The meeting terminated with a vote of thanks to the Chairman.

Monteleo Diamonds Meeting.

Mr. H. de V. Steytler preided on December 9at the fourth annual meeting of the shareholders of Monteleo Diamonds, Ltd. In moving the adoption of the report and accounts, the Chaircan said, inter alia, that the little concern, instead of being dead and buried within one year of its birth, as predicted by many wiseacres, was very much alive and producing a higher class stone, a very much higher value per 100 loads and showing no signs of decreasing in size. The present satisfactory state of affairs was not only due to the enhanced value of diamonds but also to the fact that the management had been able to size up the mine, its capabilities and the best way to handle so small a diamondiferous occurrence. They would perceive that they had not washed a hundred loads of blue ground per diem from the mine and to-day, although only washing a matter of about 70 loads of blue and making up the balance of 100 loads from the tailings, the company was making handsome profits. Of the total number of loads treated during the period under review, only 12,000 came from the mines the balance of 6,800 were made up from cylinder lumps and tailings. Notwithstanding that the make-up amounted to 50 per cent. of the ground treated, the yield per hundred loads was 16.48 carats, which realised £76 7s. 2d. per hundred loads. During the first three or four months of the period under review, very little washing was done due to the epidemic of flu, and water troubles. Up to the end of November the value per hundred loads had increased up to £101 10s. 8d., but the month of November was a phenomenal one in the history of the company, for during that month the yield from the mine realised £5,330 from 1,669 loads of mine blue and 669 loads treated from the tailings, but that only went to show what could reasonably be expected from so rich an occurrence. Against the high price of the diamonds was the high cost of production due to the few number of loads able to be treated, and to the very high cost of produce, foodstuffs and all stores. The drought had necessitated a very heavy stable account, all of which items told very seriously when taking into account the cost of production of such a small mine.

The Profit.

Last year the difference between revenue and expenditure was only a net profit of £595. For the period under review there was the marked improvement of £2,629 notwithstanding the fact that for three or four months the Company did very little washing and was put to great expense in regard to reef hauling and water troubles. If nothing unforeseen happened, the next year ought to show a very considerable increase in the profits. For the first two months of the new year, the difference between Revenue and Expenditure shows a profit of £4,890.

He wished to emphasise the importance of the fact that they had struck the diabase walls which meant that reef troubles and expenditure in that regard would be materially lessened.

The increase in the price of diamonds and the better stones now being found at the level between 120ft. and 145ft. had brought up the value of the ground treated from £41 per hundred loads. Two very valuable stones were discovered during the month of November, one being valued to £2,500 and the other at £995, so, although the mine was perhaps the smallest that was being worked in the Union, its production was certainly gratifying.

A Dividend.

The Directors had come to the conclusion that they would be fully justified in declaring a dividend. The main reason why they have hung on so tenaciously to the cash in hand was to accumulate such a reserve as would make the company absolutely independent in the event of any serious set-back, caused for example by a fall of reef or floods. The company had now secured that reserve and the Board has come to the conclusion that the company could safely part with some of its cash to shareholders. The Board recommended the payment to shareholders of a 10 per cent., dividend, payable to all shareholders registered on the 31st day of December next.

The report and accounts were adopted. Messrs Wm. Ross and A. P. Everett were re-elected to the directorate and Mr. A. E. Steytler re-appointed auditor.

It was decided to grant a bonus of 105 guineas to Mr. Thos. Wilks, the manager, to whose work, many tributes were paid.

CORONATION SYNDICATE,

The annual general meeting of the Coronation Syndicate, Ltd., was held today in the Board Room, Exploration Buildings. Senator the Hon T. A. White M.L.A., presided, and there were also present Messrs. A. Mackie Niven, G. Sonn, A. S. B. Dowling and the secretary Mr. F C. Meeser.

The chairman said: In submitting the balance sheet and accounts for the year ended the 30th June, 1919, there is practically no change in the financial position of your Syndicate. At our last annual meeting, the chairman stated that owing to the enormous increase in the working costs, the Machavie Mine had to be closed down for the time being as it was impossible under the existing abnormal conditions to work the mine at a profit. The funds guaranteed by the Directors, who were the largest shareholders, were exhausted and the Bank called up the Bond. Under the circumstances your syndicate paid to the Bank their proportion of the Bond, amounting to £7,777 and in conjunction with the other Directors of the Machavie Company, advanced a further sum of £1,538 7s., to keep the property intact.

It is a matter of considerable regret that the great increase in working costs compelled the directors to abandon working for the present especially as the difficulties in treating the refactory ore of the Machavie had been overcome and the mine under more normal conditions could undoubtedly be worked at a profit. It is hoped that before long arrangements may be made to restart operations on this property.

Negotiations are pending which will be announced through the press, next week, and will be submitted at a extraordinary general meeting of shareholders, which will be held on the 16th January. It is hoped that the proposals will be greatly to the advantage of the syndicate.

I now beg formally to move the adoption of the balance sheet and accounts as submitted.

The report and accounts were adopted. The retiring directors, Senator the Hon. T. A. White and Messrs Gustav Sonn, and A. Mackie Niven, were re-elected, and the appointment of Mr. Niven as a director was confirmed. Messrs Aiken and Carter, and Douglas Low and Co., were re-appointed, and the meeting terminated.

New Patents.

The Holt Manufacturing Company.—Tractor truck mechanism.

The Holt Manufacturing Company.—Endless chain track.

John Jackson.—Improvements in windmills.

British United Shoe Machinery (South Africa), Ltd.—Improvements in or relating to heel railing machines, and rail handling mechanism useful in conjunction therewith.

Julian Myer Harris.—Still water turbine.

Gabriel Christiaan and Erasmus Keet.—An improved device for steering head lamps or the like.

International General Electric Company.—Improvements in and relating to bearings.

International General Electric Company.—Improvements in and relating to cooling dynamo electric machines.

International General Electric Company.—Improvements in and relating to high frequency alternators.

Benjamin Franklin Rushton.—Improved process for the softening or purification of water.

Dirk Andries Tenge.—Improvements in rail fastening devices.

Holman Bros., Ltd.—Improvements in connection for the axial water tubes of rock drills.

John Russell Broom.—Detachable bit for hammer drill steel.

Thomas Linn.—Linn's signalling device for motor cars, cycles and other vehicles.

The Texas Co.—Improvements in or relating to the cracking of hydro carbon oils.

Aidan Nicholas Henderson.—Wood faced concrete flooring slabs.

Henry Ellis.—Improved method of obtaining extract from wattle and other barks.

The Climax Rock Drill & Engineering Works, Ltd.—Improvements in tubular connections.

T. J. Armstrong (S.A.), Ltd.—Improvements in apparatus for manufacturing reinforced and other concrete pipes, columns and the like.

Frank Oliver Willcox.—Timber notching machine

George Walton Hannay and Keith Indlin.—Ball operated air cock.

John Swanson Johnstone.—A new and improved fuel for internal combustion engines and the like

William Gallagher.—Improvements in means for instruments for use in surveying bore holes and the like.

Joseph Coats.—Improvements in means for locking the steering gear of motor-driven road vehicles.

James Richard Armstrong Kelly.—Improvements in or relating to shovels and the like.

Harold Eustace Deyes.—Deyes' interlocking concrete block.

The Holt Manufacturing Company.—Track link.

The Holt Manufacturing Company.—Anti-vibrating means for self laying tracks.

The Holt Manufacturing Company.—Chain track tractor.

The Holt Manufacturing Company.—Removable grouser for track links.

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DIVIDEND NUMBER 1.

NOTICE IS HEREBY GIVEN that an Interim Dividend of ten per cent. (10%), equal to two shillings per £1 share, has been declared, payable to Shareholders registered on the 31st December, 1919.

The Transfer Register of the Company will be closed from the 1st to the 14th January, 1920, both days inclusive.

Dividend Warrants will be posted to Shareholders on or about the 1st February, 1920.

By Order of the Board,
SAM. B. DOWLING,
Secretary.

Johannesburg,
11th December, 1919.

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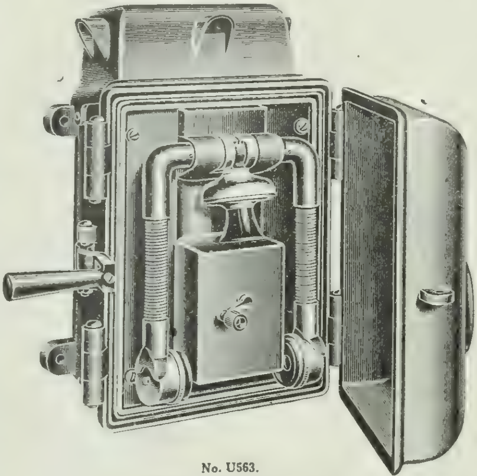

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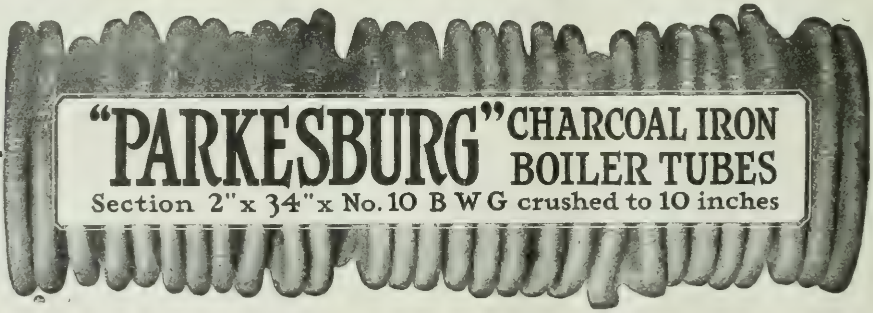

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Notes and News.

An Important Company Change.

We understand that the S.A. Townships, Mining and Finance Corporation, Ltd., and the Rhodesian Anglo-American Company—the two big companies controlled by Sir Abe Bailey—have acquired the Anglo-French Exploration Co., Ltd., and the Anglo-French Navigation Colliery at Blackhill; and that the administration of these two companies will be transferred to the offices of S.A. Townships, Mining and Finance Corporation early in January. We understand that there will be no material change in the personnel of the management and staff of the Anglo-French Companies.

* * * *

Randfontein Development.

It is officially announced that the West Reef has been struck in the north shaft of the Randfontein Central at a depth of 3,360 feet, dipping 60 degrees. The average value of seven complete sections sampled is 11·1 dwts. over 48 inches.

* * * *

Tweefontein Enterprise.

The Tweefontein Colliery Company, Ltd., have recently placed an order for six electrically driven centrifugal pumps. Both motors and pumps are being manufactured by Messrs. Mather & Platt, Ltd., of Manchester, whose local representative is Mr. H. S. King, P.O. Box 5291, Johannesburg. Five of these pumps will deal with tarry and dirty sulphate of ammonia liquor, containing 2 per cent. excess of sulphuric acid. The pumps will be used in connection with the Lymn plant about to be installed, and we hope to give some details of this plant later on, when it is in operation.

* * * *

Concessions Commission in the South-West.

A Commission has been appointed by the Administrator of the Protectorate of South-West Africa to inquire into and report upon all concessions of whatsoever nature granted or recognised by the German Government, with the exception of mining titles of diamond companies, save as to any interest therein held by the Deutsche Koloniale Gesellschaft. All persons who claim to be entitled to any concessions falling within the above terms may submit before January 14, 1920, in triplicate in the English or Dutch language a full statement of the nature and extent of their claim and titles or other legal basis upon which it is founded. Notice will thereafter be given as to dates of the hearing of the different claims. Any person desiring to oppose such claims or otherwise to give evidence upon them should submit a resume of the statement he intends to make. All communications should be addressed to the Secretary, Concessions Commission, Swakopmund.

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A New By-Product Plant.

An important announcement was made by Mr. Wm. Pott at the Tweefontein meeting this week. He said: "Your board are so impressed with the frightful waste of valuable assets in the discarding of such large tonnages of what we call our band, that is a section of about 3 ft. to 3 ft. 6 in. of coal rather below the required quality for ordinary market requirements, which occurs in the centre of the 10 ft. or 12 ft. of our 20 ft. seam which we mine, that they decided to press on with a by-product plant on their own account. The special system selected by our technical advisers is one of total destruction, not a coking plant. It is known as the Lymn Rambush plant, being an improved Mond process in which sulphate of ammonia is the main by-product produced. Gas is, of course, largely produced too, and the ideal use of such is undoubtedly in the generation of electric power for use in electrification of the Government railways and other industries. We would thus use a waste product instead of the prime product coal, saving haulages by the railway of immense tonnages of coal required for transport of export coal. The advantages to the Government, to shipping interest, to ourselves and the country as a whole of such a development of your great trade cannot be over-estimated."

The Price of Diamonds.

A cable from New York to the *Daily Telegraph* says that the demand for diamonds is greater to-day than ever before in history. It is a remarkable fact that the countries hardest hit by the War are taking their places with the foremost as gem-buying countries, and that countries that have been traditionally indifferent are now enthusiastic purchasers. The increased demand in America comes solely from working men and farmers, who eagerly buy gems of the first water, despite the constantly mounting prices. America, which formerly took 65 per cent. of cut and uncut gems in the market, now takes a little more than half the annual output. Germany, Russia, Turkey, India, China, and Japan are the six nations chiefly responsible for this change. It is said that the price of diamonds has risen from £20 a carat before the War to £120 a carat to-day, but jewellers maintain that, notwithstanding this tremendous leap, the purchases should not be classed as extravagance, because permanent value is being bought.

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A Score Against Germany.

The news of Vickers' recent deal with the Swiss engineering firm of Brown, Boveri & Co. will bring courage to the hearts of those who gloomily predicted Germany would soon recover her former hold on the trade of Europe. Vickers, Ltd., are to have the exclusive rights to the patents of the Swiss undertaking for Great Britain and the Dominions, and the interests of both firms in France and Italy are to be amalgamated. Those who know anything about electrical enterprise before the War will not need to be told what the arrangement will mean to British prestige on the Continent. We may safely leave it to the management of Vickers' to see that the most is made of the opportunity. The Germans, who practically held the monopoly of the electrical trade in Europe, will not be pleased at this turn of events.

* * * *

More Holidays on the Mines.

The Transvaal Chamber of Mines has issued the following statement:—The Chamber has had under consideration certain requests submitted by the South African Industrial Federation on behalf of the various unions, amongst which was a request that May Day should be a public holiday and that double pay should be paid on all public holidays; and more recently a request has been received from the South African Mine Workers' Union that Dingaan's Day should be a holiday without pay for the members of their Union. At the present time Christmas Day and Good Friday are allowed as public holidays on the mines, with pay. In view of the fact that these are the only two public holidays kept on the mines, the Chamber is prepared to add two more holidays with pay to those of Christmas Day and Good Friday, viz., May Day (May 1) and Dingaan's Day (December 16) in each year. In view of the generous provisions for holiday leave on the mines, ranging from a fortnight up to a month each year, it is not prepared to agree that any further public holidays should be kept on the mines, or that more than ordinary pay should be paid on those days. Owing to the proximity of Dingaan's Day, the Chamber is replying on this portion of the requests at once without waiting until its reply on the remainder of the points is prepared.

* * * *

Pretoria Industries.

The Inspector of White Labour, Pretoria, in the course of some remarks on industrial rates, says a diamond cutting industry has now been firmly established in Pretoria. Six skilled men and one apprentice are now employed, and the machinery at the firm's disposal can absorb double that number. It is expected that, if sufficient support be forthcoming, more men will be imported. It is, of course, impossible to procure men in South Africa. A marble quarry has been opened in the Pretoria district some 60 miles north-east. From an interview with the manager, it appears that the marble quarried is of excellent quality. It is an industry that may absorb many labourers, both skilled and unskilled, in the near future. Mining at Kameelfontein is still increasing rapidly; many diggers are arriving from the Rand area and other parts to take up claims. At Beyenestpoort they seem to have settled down. Everybody is hard at work and eking out a living. Some are doing very well; others just manage. There is no poverty as compared with six months ago. The Pretoria iron mines are still closed down for reconstruction purposes. A new furnace is in course of construction, but it is difficult to say when it may be ready. It may take six months. The engineering trade continues to be busy. All hands could be employed, but shortage of material is reported. The motor trade is fair; supplies come in freely with a few exceptions; all hands are fully employed.

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Oil v. Coal.

The interesting announcement was made during mail week that a large engineering establishment had perfected a railway locomotive which derives it power from internal combustion engines, using heavy oil. It was further added that eminently satisfactory trials had been made, and that the invention will shortly make its appearance on some English railway systems, resulting in a material cutting down of working expenses. The report appears to lack official confirmation, but if it is true it will be matter of considerable importance to oil-producing companies, especially such concerns as the Shell, which, owing to their exceptional position, would doubtless obtain contracts for the supply of oil to the railways. In France, too, it is reported that the railways are preparing to convert their engines to burn oil, owing to the bad quality of the coal available, while on the South American railways oil is gradually but surely displacing coal for fuel purposes. Some especially interesting remarks in this connection were made by the chairman of the Buenos Ayres Western Railway Co. recently. After the most thorough investigation, he stated, the board had decided to adopt oil as their future fuel as long as the price was favourable, and they were going to commence using it as soon as the storage tanks were erected and the necessary alterations made to their engines. A three years' contract, he added, had been arranged for supplies of oil fuel, commencing in 1920, at a price equal to coal at under £3 per ton delivered in Buenos Ayres, which compared with £6 per ton delivered in Buenos Ayres. It would be interesting to know what oil group has obtained this contract, though one could make a shrewd guess. The exceptional positions held by the Shell, Mexican, Eagle and Burmah companies make them specially fitted to undertake such contracts, and the benefit that is likely to accrue to them in future years, as oil gradually supersedes coal as fuel, will be tremendous.

* * * *

South African Diamond Corporation.

This company's report for the year ended June 30 reflects the greatly increased prosperity of the diamond-mining industry referred to from time to time in these columns. The net profit amounted to £44,472, in comparison with £32,152 for the previous year. Dividends paid totalled 25 per cent., absorbing £25,000, against 7½ per cent. for 1916-17, and after setting aside £15,000 as a nucleus for a reserve fund, which it is intended to build up in future by annual allocations out of profits, there remains a balance of £4,472, which, added to the carry-forward, increases same to £8,781. The issued capital remains unaltered at £100,000 (of an authorised amount of £1,000,000), and the balance sheet at June 30 shows shares in other companies (the company itself is mainly a shareholding concern) valued at £257,181, and debtors and cash amounting to £29,978, as against, on the other side, creditors and loans £145,929, bills payable £8,146, and income tax reserve £9,469. Shares held in other companies, according to the directors' report, have a market value considerably above their book value. Diamond-mining interests predominate, particular holdings being in New Vaal River, Roberts Victor, Blaauwbosch, and Pniels. Eastern Rand interests—Brakpan, Springs and Rand Selection companies—are also represented. The directors express confidence in the continued prosperity of the diamond industry, and even go so far as to say that though share prices have advanced in value, the prosperous condition of the trade is by no means yet reflected in present share prices.

The Half-Year's Dividends.

Several of the dividend declarations for the second half of the year have now been announced, but it will not be possible to print our usual complete list until next week. De Beers Co. has declared the following dividends: Preference 10s., less 7½ per cent. tax; Deferred 30s. interim, free of tax. The Cons. Goldfields and Van Ryn Estates have both declared dividends of 1s. 6d. each, free of tax. The Meyer and Charlton is paying 50 per cent. The Barnato declarations are, as anticipated, excellent. State Mines are paying 4s. per share; Van Ryn Deep, 5s. and a bonus of New States; Langlaagte Estate and Consolidated Langlaagte, 1s. 6d. each; New Unified, Knights and New Primrose, 1s. each. Pretoria Portland Cement are paying 3s. per share, and Swazi Tin 1s. 6d. Brakpan pays 3s. per share; New Era are distributing enemy shares equal to a dividend of 29·75 per cent.; Rand Selection pays 10 per cent.; and Springs is passing its dividend.

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The Film as an Advertising Medium.

Last week, at the Bijou Theatre, at the request of the conference called together by the S.A. Railways for discussion of bringing the conditions of Africa before people Overseas, the African Film Productions, Ltd., exhibited various films taken to the order of and by arrangement with the Government of the Union of South Africa and other public bodies. The programme was a comprehensive one, including a scenic picture of a town, namely "Beautiful Maritzburg"; one of a country village with scenery, "Mossel River, Hermanus"; an exterior industrial picture, that of "Orange Growing"; an interior industrial picture, that of "Soap Making"; and also pictures of the Sugar Industry in Natal, and the Coaling Appliances at the Bluff, Durban. The display was a pronounced success.

* * * *

Scottish Mashonaland Gold Mining.

The report of the Scottish Mashonaland for the year to June 30 last states that the company's holding of 50 mining claims in the Lomagundi and Mazoe districts shows no alteration, and no work has been done on these properties during the past financial year. The market value at June 30 last of the company's investments having a Stock Exchange quotation, and which stand in the books at a cost of £58,763, was £32,257. In addition the company holds £3,500 National 5 per cent. War Bonds, £2,000 5 per cent. War Loan, 1929-47, and £2,000 4 per cent. Funding Loan, all of which stand in the books at a cost of £6,972. The total value of the company's investments on October 15 was £40,296. The operations of the company during the past year show a substantial improvement on the preceding year, a net profit of £4,598 having resulted. After writing down the mining claims to a nominal value of £1, a balance of £3,099 is left, which, with £368 brought in, makes a total at credit of profit and loss account of £3,467, which it is proposed to carry forward. The improvement shown has arisen chiefly from the profit realised on sales of investments, this amounting to £3,439, as compared with £368 for the previous twelve months, and the amount derived from dividends shows an increase, the sum received being £1,912, as compared with £1,595. The directors are of opinion that the time has arrived to decide: (1) Whether the company shall continue operations for the present with a view to eventual liquidation of the company; or (2) go immediately into voluntary liquidation. The directors are of opinion, seeing the result of the last two years' working, that the interests of the company would best be served by adopting the first course and continuing operations, but in order that the shareholders themselves shall decide, a form is supplied to them on which, if they are in favour of immediate liquidation, they can express their view. In the event of a sufficient majority of opinion being received in favour of immediate voluntary liquidation, the necessary extraordinary general meetings will be convened for that purpose at a later date.

TOPICS OF THE WEEK.

THE SIMMER DEEP AFFAIR.

SINCE last week the Simmer Deep trouble has undergone several dramatic changes. Last week we chronicled the fact that members of the Mine Workers' Union on the Simmer Deep struck as a protest against the dismissal of an enemy subject on account of the alleged falsification of his certificate. The next step was that the management of the Consolidated Goldfields agreed to reinstate the dismissed man, pending the reference of the whole question of the employment of enemy subjects to a Board of Reference. Thereupon the other workers on the Simmer Deep, exclusive of the bulk of the members of the Mine Workers' Union, recorded a protest of their own. By 319 votes to 27 they decided not to work with the German employee on the Simmer Deep. The great majority of the local members of the M.W.U. refused to take part in the ballot, and it is said that the Executive of the Union intends to penalise any member suspected of taking part in it. Their attitude is summed up in two sentences from Mr. Forrester Brown's speech last Saturday. He said: "I am a war on warite. If a man is discharged on account of his nationality we are going to fight it out, no matter where it is. Then if it is a question of returned soldiers against the workers of the Rand we will have a scrap and we will beat them." The reply of the returned soldiers is to remain on strike, and the mine, except for pumping, is closed down. At a mass meeting organised by returned soldiers' organisations and held at the Town Hall steps on Thursday, the following resolutions proposed by Mr. Leslie Blackwell, M.L.A., and seconded by Mr. T. G. Jones, of the Returned Soldiers' and Sailors' League, were passed unanimously: "This meeting of returned soldiers and citizens protests in the most emphatic manner against the action of any body which insists on the employment of enemy subjects while returned soldiers are unemployed, and will resist to the utmost any such action." "Both returned soldiers' organisations hereby place on record the fact that, as a majority of returned soldiers are trades unionists, the principle involved in this dispute is not a question of trades unionism." There, at the time of going to press the matter rests, and it is clear that the issue at stake is a very serious one. We need hardly say which side has the sympathies of all reasonable people. To the returned soldier is due, in all justice, preference before any other candidate for employment—certainly before any alien. If the Nationalist and Internationalist speakers for the Union are out to fight the returned soldier, as they say they are, the chief sufferer is bound to be organised labour on the Rand. The War is too fresh in the memory of the men who risked everything to fight for them to forget it. They are not likely to bow to frothy outpourings of people who glory in that they have no country and no pride of race. The sentiments of the loyal workers of the Reef and of the loyal section of the whole community cannot be flouted in this fashion. We confidently expect that the leaders of the Mine Workers' Union will speedily come to recognise the depth and sincerity of the feeling they have aroused against them at the Simmer Deep and along the Reef.

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AMERICAN FIRM GETS ORDER FOR WORLD'S BIGGEST WINDERS.

New Randfontein Central Winders to be Supplied by General Electric Co.—Swiss Firm to Supply Big Pumping Plant.

We understand that the two big winders—claimed to be the biggest in the world—to be installed at the Randfontein Central deep level shafts are to be supplied by the South African General Electric Company and made in the U.S.A. The mechanical portion of the work will, however, be placed with an English firm. Mr. Munro, the chairman of the "J.C.I.," said that the new winders would be capable of raising a net load of five tons each from a depth of 5,000 ft. at 4,000 ft. per minute. It will be recalled that the Crown Mines winders, which have hitherto held the record, can raise 8 tons net some 3,500 ft. at the same speed, so that there is little to choose between them and those to be put in at Randfontein. Randfontein will also be installing one of the biggest pumping plants in the world soon, and it is understood that the well-known Swiss firm of Sulzer Bros. will be the suppliers. British manufacturers apparently are suffering through the attitude of British labour, and it may be of interest to quote here what Mr. Wilson Goode, British Trade Commissioner at Capetown, had to say on the subject of mining machinery and pumps in his last report. "In point of value," he wrote, "the imports into South Africa in 1913 were £765,986, of which the United Kingdom supplied goods to the value of £511,968 and the United States of America to the value of £161,191. German goods were valued at £73,939 and Danish goods at £11,273. In 1918, the total imports were valued at £569,448 and the imports from the United Kingdom were valued at £292,123, from which it will be seen that the United Kingdom supplies were far lower in proportion to the total in 1918 than in 1913. On the other hand, the imports of American machinery in 1918 were valued at £271,730 and, consequently, the proportion of America's contribution to the total imports in 1918 has increased as compared with her proportion to the total in 1913. It must, however, be borne in mind that during the War the facilities to obtain machinery from the United States of America were considerably greater than in the case of the United Kingdom." In regard to pumps, he said: "The demand, particularly for pumps used in connection with the mines, is very great. In this connection, it is well to call attention to the advisability of introducing a British manufactured high lift centrifugal pump for heads up to 2,000 to 3,000 feet. The bulk of this business is in the hands of foreign manufacturers, notably a large firm of manufacturers in Switzerland. It will be a matter of some difficulty to introduce British competition in this direction, because the pumps supplied by foreign manufacturers have, in most instances, given complete satisfaction. It not infrequently happens that the supply of an important branch of machinery encourages a demand for supplies of other manufactures from the same source. For example, there are many mines in which not only pumps of foreign manufacture have been installed, but also pump-motors and pipe columns."

TRANSVAAL SILVER SUCCESSFUL FLOTATION

Eleven Times Over-subscribed—A Five Per Cent. Allotment !—Silver Prices.

The Transvaal Silver and Base Metals, Ltd., issue of 35,000 shares has been eleven times over-subscribed. Some 2,800 individual applications were received, and it is expected that when the small applicants are satisfied there will remain enough shares to permit of a 5 per cent. allotment to the others. Each share carries with it an option to take up another share at 25s. for a year from January 1 next, and it would seem that both shares and options are likely to be popular investments in view of the rising prices of both silver and lead. The latter is now over £40 per ton and still rising. Regarding silver, it is said that heavy purchases in India and other Eastern countries are the cause of the great rise, these buyings being the result of the prosperity of those countries after the War. At the same time, largely as the result of the Mexican revolution, the world's production of the metal has fallen off to a very great extent. In 1911 it reached the record figure of 226,000,000 ozs., while for 1917 the total was no more than 167,000,000 ozs., and it is probable that there has been a further reduction. It is true that there are some signs of an improvement in the condition of affairs in Mexico, but, on the other hand, the output from that country was much smaller in 1917 than in 1916, and even at the best the recovery of the industry is expected to be very slow. Moreover, there has been a falling off lately in the United States production, owing to the restriction of the output from the copper mines, such as the Anaconda, of which silver is one of the by-products. The famous Canadian Cobalt mines also seem to be becoming less productive. Another very important factor is that the Germans have to hand over to the Allies the whole of the gold reserves in the Reichsbank, and, unable to obtain gold, Germany must inevitably turn to silver. Germany was responsible for the great fall in the value of silver which took place in 1871 through the demonetisation of her thalers, and equally she may quite possibly be responsible for the price of silver recovering to the level at which it stood previous to the Franco-Prussian war, if she is forced to go back to a silver standard. There are many other factors, which all have a bearing upon the position, and it does not appear likely that there will be any early increase in the world's production of silver. It is noteworthy that the cost of producing silver at the Nipissing mine at Cobalt, Ontario, is as follows, according to the company's annual report: Exploration, 5s. 6·45d. per ton, 1·46d. per oz.; drilling, 1s. 0·3d. per ton, 0·27d. per oz.; development, 3s. 8·85d. per ton, 0·985d. per oz.; stoping, 5s. 4·1d. per ton, 1·41d. per oz.; hauling dumps, 0s. 4·1d. per ton, 0·09d. per oz.; shipping residue, etc., 0s. 2·05d. per ton, 0·045d. per oz.; assaying, etc., 0s. 6·1d. per ton, 0·135d. per oz.; management, 2s. 2·25d. per ton, 0·575d. per oz.; camp, 0s. 5·6d. per ton, 0·125d. per oz.; insurance, taxes, 10s. 7·65d. per ton, 5·185d. per oz.; general, legal, 0s. 7·95d. per ton, 0·175d. per oz.; high-grade mill, 7s. 4·9d. per ton, 1·955d. per oz.; low-grade mill, 20s. 11·85d. per ton, 5·54d. per oz.; depreciation, 3s. 0·25d. per ton, 0·795d. per oz.; marketing, 3s. 5·3d. per ton, 0·91d. per oz.; corporation, etc., 1s. 0·7d. per ton, 0·28d. per oz.; total, 75s. 6·4d. per ton, 1s. 7·935d. per oz.; less sundries, 1s. 7·35d. per ton, 0·425d. per oz.; net cost, 73s. 11·05d. per ton, 1s. 7·51d. per oz.; the total cost of production was 35·75 per cent. of the gross value of the output.

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THE TROUBLE ON THE RHODESIAN MINES.

Up to the time of going to press the men on the chief gold mines of Rhodesia remain on strike. Wankie Colliery, however, is unaffected. The *Bulawayo Chronicle* in the last issue to hand says: In view of the Conference which has been sitting in Bulawayo during the past few days of representatives of the Mine and General Workers' Association and of certain of the mine managements, we had hoped that a general settlement would be reached of the points in dispute between the recently-established trade union and the employers. Unfortunately, news came last night of a strike at the Rezende mine, following upon the non-compliance with an ultimatum to that mine, which took the form of a twenty-four hours' notice to the management either to grant the demands formulated by the Association or to take part in the Bulawayo Conference. According to our Salisbury correspondent, the directorate made certain liberal offers to the men, the result of which had not been announced. We understand, however, that the view of the Mine Workers' Union executive is that the Penhalonga men have been called out. The attitude of the Rezende management is similar to that of some other Rhodesian mine managements not represented at the Bulawayo Conference, that conditions at the very various and widespread mines of Rhodesia differ to such a great extent that it is impossible for them all to make similar conditions of work and pay, and that any negotiations must be between individual mines and their own workers. This is the point on which the newly-formed union has called out the Rezende workers, the intention being to insist upon what is called the system of collective bargaining. It should be noted that the Bulawayo Conference of the past few days has been attended only by the Goldfields group and the Wankie Colliery representatives on the side of the employers, though the union claims a willingness of the Lonely Mine manager to abide by the Conference's decisions. The position in regard to the Globe and Phoenix is that a special agreement lasts until the end of the year. In the interests of the whole country as well as of the mine workers and the mining industry, it is exceedingly regrettable that a strike, or even a threat to strike, was not avoided while an effort at conciliation like the Bulawayo Conference was actually in progress. That such a thing should have happened is opposed to those principles which alone can save this or any other country from the disastrous course which is so largely to blame for present unsatisfactory economic conditions. A much better way is indicated by last night's news from England of the appointment of the first members of the new permanent Industrial Court, the composition of which is calculated to inspire the confidence of all classes that justice will be done in future without need for inflicting such all-round injury upon every class, and most of all upon the workers, as must follow any considerable stoppage of work.

PERSONAL.

Mr. E. Oppenheimer has left for Capetown to meet Mr. H. C. Hull.

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Mr. H. O. Buckle has been offered the paid Chairmanship of the Transvaal Chamber of Mines.

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Several Rhodesians, notably the Administrator, Sir Drummond Chaplin, have been visiting the Rand lately.

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Mr. D. Wilkinson, formerly Consulting Engineer to Neumanns, has accepted the post of Consulting Engineer to the Consolidated Gold Fields.

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Messrs. M. Cullen, F. C. Sturrock, J. M. Kirkland and Hayhoe have joined the board of the S.A. Aerial Transports, Ltd., in an advisory capacity.

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Mr. J. W. Kirkland has left on holiday for the Cape. Mr. Kirkland will visit S.-W. Africa during his trip, and will finish up at Kimberley, whence he will return to Johannesburg by aeroplane.

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Congratulations to Mr. Henry S. Potter on winning the gold medal of the S.A. Institution of Engineers for his paper on hammer drills. Mr. Potter, we understand, is introducing a new hammer drill which is to be named after him—"the Pot-R-Max."

* * * *

At a meeting of the South African Institution of Engineers held in the Chamber of Mines, Johannesburg, last week, the awards for the 1918-19 session were announced as follow:—Institution's Gold Medal: Mr. Henry S. Potter for his paper on hammer drills. Central Mining/Rand Mines Award: Mr. T. H. Bayldon for a paper entitled "Some Notes on Experiments made with a view to Reducing the Consumption of Explosives and Increasing the Fathoms Broken per Machine Shift in Machine Stoping." Ingham Prize: Mr. G. M. Clark for paper, "A Form of Mollier Steam Diagram."

WHY THE MACHAVIE MINE CLOSED DOWN.

Speaking at the Coronation Syndicate annual meeting last week, the chairman said that at the last annual meeting the chairman stated that owing to the enormous increase in the working costs the Machavie mine had to be closed for the time being, as it was impossible under the existing abnormal conditions to work the mine at a profit. The funds guaranteed by the directors, who were the largest shareholders, were exhausted, and the bank called up the bond. In the circumstances the syndicate paid to the bank its proportion of the bond, amounting to £7,777, and, in conjunction with the other directors of the Machavie Company, advanced a further sum of £1,538 7s. 6d. to keep the company intact. "It is a matter of considerable regret," said the chairman, "that the great increase in working costs compelled the directors to abandon work for the present, especially as the difficulties in treating the refractory ore of the Machavie had been overcome, and the mine under more normal conditions could undoubtedly be worked at a profit. It is hoped that before long arrangements may be made to restart operations on this property." Negotiations were, he added, pending which would be announced next week, and would be submitted at an extraordinary general meeting of shareholders which was to be held on January 16th. It was hoped that the proposals would be greatly to the advantage of the syndicate.

The certificates granted by the Mines Department for the period ending 13th December, 1919, were as follows:—Mine Overseers (Metalliferous Mines): K. J. MacWilliam, W. M. Main, P. L. Ruiter. Mine Surveyors: A. Kelly, C. E. Richards, E. R. Roberts, M. Schaap. Assayers: C. R. Cookson, S. R. Fleischer, R. Green, W. J. R. Hunter, R. J. B. Kethel, W. A. H. Lewis, D. W. Pugh, E. A. D. Rubidge, G. de R. Thompson

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ORE RESERVES AND DEVELOPMENT AT THE SPRINGS MINES.

Points from Official Report of the Inspector of Mining Leases.

I.—Ore Reserves.

In the course of his report on Springs Mines for the quarter ended September 30 last, appearing in last week's issue of the *Government Gazette*, Mr. J. H. Twiddy, the Government Inspector of Mining Leases, writes:

1. During the quarter the reserves as at 30th June, 1919, were estimated, the pay limit adopted being 5 dwt. over a stoping width of 50 inches, the particulars being as under:

		Stoping width.	
Reserves.	Tons.	Inches.	Dwt.
(a) Payable—			
Available	1,181,255	61·4	8·18
Unavailable	582,173	63·8	9·41
Pillars	480,506	62·4	9·23
Totals and averages...	2,243,934	62·3	8·73
(b) Unpayable	6,480,769	51·3	2·19

2. The total payable ore reserves as at 31st December, 1918, were 2,222,028 tons, valued at 8·72 dwt., over a stoping width of 62·8 inches. It will, therefore, be seen that there has been an increase of 21,995 tons, the value and width being practically the same in both estimations.

3. The total tonnage mined from the payable ore reserves during the six months January to June was 201,738 tons, whilst the total payable ore developed was 215,339 tons, making an excess of ore developed over that mined of 13,601 tons. The proportion of the reef exposed on the perimeters of the blocks averages 41 per cent. of such perimeters, as compared with 37 per cent. in the previous quarter. Boreholes to the number of 112 have also been put in, proving the existence of reef on the boundaries of the payable blocks.

II.—Shaft Sinking—No. 3 Shaft.

4. The footage sunk amounted to 581 feet, and the footage timbered to 585 feet, the total depth of the shaft being 2,046 feet, of which 2,011 feet are timbered.

5. Compared with the previous quarter, there was a decrease in footage sunk and timbered of 32 feet and 38 feet respectively, dykes and faults somewhat interfering with the sinking. Leaders belonging to the Kimberley series were intersected, but of narrow widths and low values. The Kimberley shales were encountered at a depth of 2,089 feet, and it is anticipated that the Main Reef Leader will be struck at a depth of 3,400 feet. A pumping station was cut at a depth of 1,996 feet.

III.—Development.

6. A summary of the development work is as follows:—Drives, 1,503 feet; winzes and raises, 1,157 feet; haulageways, 1,471 feet; crosscuts, etc., 424 feet; total, 4,555 feet. Footage on reef, 3,280 feet; footage sampled, 3,235 feet; footage payable, 2,325 feet, equal to 72 per cent.; average reef channel width of payable footage, 20 inches; average reef channel value of payable footage, 25·1 dwt.

7. Compared with the previous quarter there has been a decrease in the footage developed of 718 feet and of that sampled of 655 feet, whilst the payable percentage of the total footage sampled has improved from 66 per cent. to 72 per cent., the average value of 507 inch pennyweights being practically the same.

8. The decrease in the development footage is due to various causes, the chief being the great distance that some of the faces are from the general air current necessitating their being held up until certain connections are made, and also that certain secondary development proceeding during the previous quarter is now connected up.

IV. Mining.

9. The rock broken in the mine according to survey measurements amounted to 140,390 tons. In addition there were 12,061 tons dumped as waste.

10. The rock broken came from the following sources:

			Sampled value.
	Tons.	%	dwt.
Payable ore reserves	106,589	76	8·1
Other than payable ore reserves	10,559	8	5·0
Development	23,157	16	4·5
Other sources	85		2·4
Total	140,390	100	7·2

The average stope width was 63 inches; the average reef channel width was 24 inches; and the average stope width in payable reserves was 64 inches.

11. Compared with the previous quarter there was an increase in the tonnage mined of 12,974 tons and a decrease in value of 1·2 dwt., the rock from all sources having depreciated.

12. The average value and width of the ore mined from the payable reserves, according to data adopted in the estimation of reserves as at the 30th June, 1919, were 8·38 dwt. over 62·07 inches, while the payable reserves as a whole at that date averaged 8·73 dwt. over 62·23 inches. The ore mined from these reserves approximated closely to the estimated value, being 0·28 dwt. lower.

13. In the estimation of the payable reserves as at 31st December, 1918, the average stoping width in those blocks from which the payable ore was mined during the six months January to June is given as 60 inches, and the average channel width as 24 inches, thus allowing an ex-

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ternal waste width of 36 inches, equivalent to 60 per cent. of the stoping width, and the actual mining in these reserves during the six months January to June showed the actual width to be as estimated, but the estimated stoping width was exceeded by one inch, thus increasing the external waste width to 37 inches.

14. The average external waste width carried in all stopes in both the payable and unpayable reserves is 38 inches, equivalent to 62 per cent. of the average stoping width.

15. Figures have not been compiled to show on the average how this waste is apportioned between the hanging and footwall, but it is estimated that it may fairly be distributed equally between the two. This would then give an average of footwall waste of, say, 19 inches, which might be considerably reduced. A certain percentage of the total waste, of course, is utilised in pack building.

16. Assuming that the mine could be worked under the most favourable circumstances, that is to say, with hammer-boys or with some small hammer type of machine, there should be little difficulty in reducing the stoping width to an average of 55 inches, or 6 inches less than the present average. At present between 85 and 90 per cent. of the stoped rock is broken by Leyners and the balance by small hammer machines and hammer-boys. The actual amount of waste sorted out both underground and on surface is satisfactory.

V. Ore Treatment.

17. Ore hoisted from mine, 140,598 tons; ore sent to crushing and sorting stations, 140,598 tons (or this amount 450 tons were left in the mill bins); waste sorted (19·81 per cent.), 27,848 tons; tonnage milled, 112,400 tons; value of ore before milling, 9·09 dwt.; average assay value of residues, 0·518 dwt.; gold obtained, 48,119 oz.; gold obtained per ton milled, 8·56 dwt.

18. Compared with the previous quarter there has been an increase of 7,890 tons in the tonnage milled and 1.143 ounces in the gold obtained. The value of the ore before milling, however, decreased 0·32 dwt.

19. The average monthly tonnage milled was 37,466 tons, the milling capacity of the plant being 41.666 tons.

VI. Mining Expenses.

20. The total cost of mining and delivery to the headgear, including development, amounted to £122.977 19s. 9d.

21. The actual expenditure on development was £42,467 4s. 2d. The fixed charge for development prior to 1st July was 2s. 6d. per ton milled.

22. Compared with the previous quarter the mining costs, exclusive of development, show an increase of 3¾d. per ton milled, largely due to the increased contribution under the Miners' Phthisis Act. The amount actually spent on development decreased by £4,780 8s. 2d.

The Lonely.

The following are particulars of the output of gold, etc., from the Lonely Mine for the month of November: Mill ran, 681 hours; crushed, 4,480 tons; fine gold recovered, 1,973¼781 oz.; value, £8,325 18s. 10d.; slimes treated, 4,480 tons; fine gold recovered, 3,960·884 oz.; value, £16,669 13s. 11d.; total fine gold, 5,939·665 oz.; total value, £24,994 12s. 9d.; profit, £13,270 2s. (including adjustment April, May, July bullion, £306 9s. 11d.).

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MINING · QUESTIONS: CHAMBER OF MINES' REPORT.

The report of the Executive Committee of the Chamber of Mines states, *inter alia*:—The 27th dust sampling survey of the mines, which was completed during the period under review, shows an average dust content of 3·1 milligrams per cubic metre of air sampled. In addition, 7,715 dust samples taken by mine dust inspectors during the three months ended 30th November were analysed in the Chamber's laboratory. At the end of October the Chamber's laboratory was removed to larger premises in the General Mining Building, Main Street. This step had become necessary owing to the increase in the work of the dust sampling department.

Collieries.

The question of the adoption of a 48-hour week for collieries has been under consideration by the Collieries Executive, and an offer was made to the Union to reduce the working hours to 54 hours bank to bank as from 1st January, 1920, 51 hours bank to bank as from 1st April, and 48 hours bank to bank as from 1st July, the present rates of pay to be maintained. This offer is intended to apply to all collieries, members of the Chamber, with the exception of Breyten, Welgedacht and South Rand Exploration, which collieries are not at present in a position to concede the shorter working hours. Conferences on this question have been held with the Union at Witbank and Johannesburg, and in addition to the question of hours, suggested minimum rates of pay for various classes of employment were discussed. A further list of requests for mechanics employed on collieries has also been under consideration, and is being held over for discussion until after the National Conference of Employers and Employed.

Industrial Conditions of White Employees.

Demands of mine employees: A list of requests on behalf of the employees on the gold mines were received from the South African Industrial Federation, which are receiving consideration. Requests for minimum rates of pay have been received from the Surface Officials' Association, the Association of Certificated Mechanical and Electrical Engineers, and the Association of Assayers. These are now under consideration. It was decided to extend the scale of the War bonus scheme so as to include officials earning up to £50 per month. The extended scale came into operation as from 1st October. In accordance with the agreement arrived at between the Chamber and the Reduction Workers' Association, a six-day week for reduction workers came into force as from 1st September, 1919. The South African Mine Workers' Union is not a party to this agreement. The following Boards of Reference sat during the period under review: Barnato Group—Reduction Workers; Brakpan Mines—J. Loots; Cornelia Colliery—Oosthuizen; Durban Deep—Mine Captain; Durban Deep—Colour Bar; Knights Deep—Van Heerden; Knights Deep—Reduction Workers; Luipaardsvlei—Battery Manager; Modder B.—D. J. Smith; New State Areas—Pumpmen. Preliminary investigation: Langlaagte Estates—Contracts.

Strikes.—(a) Cornelia Colliery: On 4th November a strike took place at the Cornelia Colliery owing to a disagreement between the management and the men in regard to alleged double punishment of one of the employees on the colliery. A Board of Reference had already considered the question and arrived at a decision which, on being given effect to, settled the strike. (b) City Deep: On 25th November the underground employees of the City Deep went on strike without submitting the dispute to a Board of Reference, thus breaking the agreement between the Chamber and the Union. The Union repudiated the action of the men and after some discussion they returned to work. The matter in dispute was subsequently discussed and settled with the management without difficulty.

National Conference of Employers and Employees.

The National Conference of Employers and Employees convened by the Government opened in Pretoria at the beginning of November, at which the Chamber was represented by Messrs. French, Davis, Wessels, and Roberts, and by Messrs. Black and Addie on behalf of the Collieries Committee. After deliberating a week the Conference adjourned until the 8th December.

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INTERNATIONAL LABOUR CONFERENCE, WASHINGTON

A request was received from the Government for the nomination of a delegate to represent the employers of South Africa at the International Labour Conference, convened by the League of Nations and held at Washington, on 29th October. Mr. W. Gemmill, the Chamber's Actuary and Labour Adviser, was nominated and duly proceeded to Washington.

GOVERNMENT CONFERENCE ON EXCHANGE RATES

A Conference was recently called by the Government, representative of Importers, Gold Producers, Banks and the Government, at which the following resolutions were passed. (1) (a) That the establishment of natural exchanges and of a free market for gold in the Union is desirable. (b) That, to this end, the establishment of a mint and refinery should proceed with the utmost despatch. (c) That the Gold Producers be requested to take steps to secure the modification of their selling agreement with the Bank of England so as to permit of termination at short notice. (d) That the embargo on the export of specie be not continued after the establishment of a mint. (2) During the course of their investigations the Conference has been impressed with the necessity for one uniform Bank Act for the whole Union and would impress upon the Government the urgency of the introduction of such a measure in the next Session of Parliament which should provide *inter alia* stringent provisions against the inflation of currency.

MARKETING OF GOLD.

The new arrangement between the Bank of England, the Union Government and the Gold Producers of the Transvaal, under which all gold, with the exception of such small quantity as may be required for local currency purposes, is consigned to the Bank of England and sold by the Gold Producers' agents was capable of termination on six months' notice. A reduction in this period, it is hoped, will be arranged with the Bank of England.

The Refinery Sub-Committee has been inspecting sites, and plans and specifications for the buildings and equipment are being prepared, and are expected to be completed in the near future. The Government has, by Proclamation, prohibited the export of gold over the inland borders of the Union on terms similar to those prevailing Overseas in amounts exceeding £5. A Commission has been appointed to consider the working of the Local Government Ordinance, Local Government Rating, Municipal Elections and certain draft Ordinances, and to make such recommendations as it may deem advisable. The Executive Committee is submitting its recommendations on certain aspects of the terms of reference. The Chamber has again made representations to the Government on the subject of the administration of this office with a view to ensuring that information in relation to specifications of patents is duly collated and rendered readily available.

Belgian-Congo Cotton: New Company.

The *Independance Belge* says that at a meeting at the Ministry of Colonies here of leading men in the industrial and commercial world of Belgium it was decided to form a limited liability company with a capital of 5,000,000f. for the culture, shipment, and sale of cotton. The Minister for the Colonies explained that an option on half the capital would be offered to manufacturers and companies as an inducement to them to interest themselves in developing cotton growing in the Belgian Congo. The company will take over at cost price the State cotton mills, and will control prices, so that the natives shall receive a fixed price for their output.

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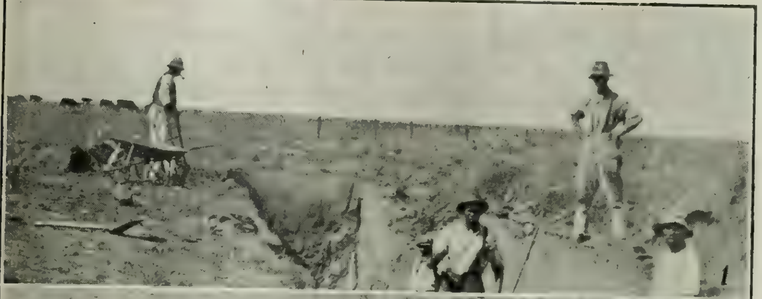
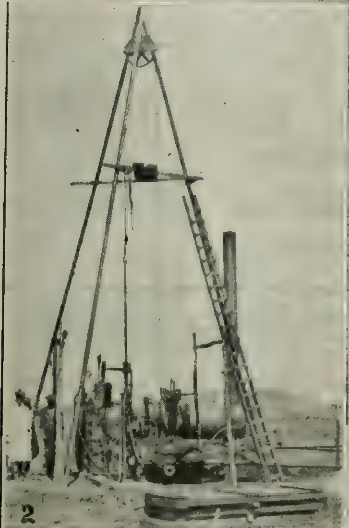
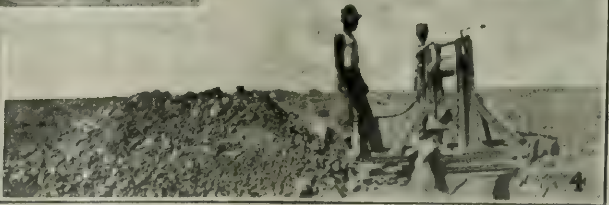
PROSPECTING ON THE SOUTH-WEST RAND.

The accompanying photographs illustrate preparatory development operations on the property of the Armistice Syndicate (New Steyn Estate area), to which we made reference in our last issue.







1. Costlaning on the Armistice Syndicate's Ground.
2. Diamond Drilling on the Western Section, of the Property
3. Bottomley's Mill, adjoining the Armistice Claims.
4. Sinking a Prospect Shaft.

Crown Diamonds.

The Secretaries write that washing operations started on the Crown Diamond Mine on the 1st inst. During the past two months work has been confined to cleaning out the mud from the open workings and generally getting the plant conditioned. Initial progress will be slow, principally owing to the dearth of native labour. As the supply improves, it is anticipated that the rate of washing will increase up to the full capacity of the gear. The first few days' washing will be taken up in putting through a certain amount of mixed ground which is too good to put on the dump, and which has to be removed from the mine before the cleaner ground can be made more easily accessible.

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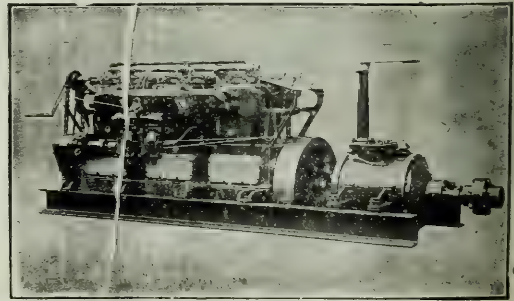

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THE V.F.P. AND MINE POWER COSTS.

How Mines Purchasing Power Under the Load Factor Agreement are Affected.

The following is the second portion of the paper read by Mr. H. W. Clayden before the S.A. Institute of Electrical Engineers on the question of costs of purchased power to the mines of the Rand:

(a) *Stamp Mills, Tube Mills and Reduction Plant.*—The load factor obtainable on this plant varies from 85 per cent. to 90 per cent. on the older milling plants of the Rand, but on new plants erected since the Sunday Observance Act came into force, the loss of four days in a 30-day month is 13·3 per cent. reduction in running time and the load factor will not exceed 75 per cent. to 80 per cent. The mill and tube mill load is a constant, except for stamp and screen repairs, relining of tube mills, etc. The cyanide sands and slimes plant is a variable; but as the slimes and sand discharge must be done on day shift, and the cycle of operation of cyanide treatment does not lend itself to a definite time for each operation at some time during the month, the peak load coincides with the maximum load hour.

(b) *Surface Winding, Transport, Crushing and Workshops.*—With the present system of single shift working, the main winding plant is usually worked at maximum capacity during the day shift, all transport, crushing of ore and the mine workshops are also on peak load only. This brings down the average load factor to between 30 per cent. and 35 per cent. The individual mine load factor cannot be reduced, but the group factor may be slightly reduced by arranging the time of winding from the lower ore bins in the mine at stated times as between two or three mines of the group; the diversity factor due to this arrangement will not exceed 1·1.

(c) *Air Compressor Plant.*—The peak load of this class of plant must occur on the maximum peak load hour, due to the air supply for drilling being required on day shift only, and as the plant only works from 8 to 10 hours per working day, the load factor is the lowest of any mine power requirement, and will vary between 25 per cent. and 30 per cent., very rarely exceeding the latter figure.

(d) *Mine Pumping, Underground Ventilation and Winding.*—The load factor on this class of work, practically all underground power requirements, varies considerably, but is usually between 50 per cent. and 60 per cent. Any improvement to be made can only be obtained by alteration in pumping hours, and then only if the underground sump capacity allows the peak load of pumping plant to occur after the peak load hours of the other classes of plant. On the other hand the sump capacity on many of the older mines is very limited, and the amount of water used in mining has increased tremendously during the last few years, this increase being all on day shift when the rock drilling is in progress and generally necessitates working the pumping plant to full capacity during the peak load shift. For mines purchasing power under the load factor agreement, this point should not be lost sight of when installing new pumping plant, and on one installation we have on hand at the present time for centralising the mine pumping with turbine pumps of 500 h.p. each the following plan has been adopted. The pumps working multiplied by hours will be approximately 40 per 24 hours. The sump capacity will be large enough to allow of one pump only working during day shift, the water will be accumulated and the second pump will never be run on the hours of mine or group peak load, and this will help the group factor to some extent.

Lighting.—I have omitted the lighting supply, as this only represents about 1 per cent. of the total kw. hours purchased, and a portion of it is used on the peak load for lighting underground. The surface lighting does not affect the mine peak load and the kw. hours used probably help the load factor to the extent of 1 per cent.

From the above, it is obvious that on any group of mines with only 30 per cent. of the total plant installed working at above 70 per cent. load factor, it is impossible to obtain a general factor of 70 per cent. Ten years ago, when this agreement was entered into, very little information was available as to load factors and cost of power on the mines and at that time double shift working was generally in vogue on all mines, which would probably have doubled the present factor on hoisting and compressed air supply, but I do not think at that time on a totally electrically equipped mine with motor driven compressors, a factor over 65 per cent. would have been obtained. To prove this I will give the figures on one mine of the group which is electrically equipped throughout except for the compressed air plant, which consists of one electrically-driven and one steam-driven compressor. All the plant is working at full capacity and crushing slightly more than the tonnage for which it was designed. Stamp mill, load factor 85 per cent.; tube mills, load factor 88 per cent.; tailings pumps, load factor 70 per cent.; cyanide and slimes plant, load factor 65 per cent.; hoisting (surface main), load factor 27·5 per cent.; crushing and workshops, load factor 31 per cent.; compressor, load factor 26·5 per cent.; underground pumping, ventilation and hoisting, load factor, 60 per cent.; load factor of mine on mine peak load, 51 per cent.; load factor of mine on group peak load, 60 per cent.; load factor of mine on mine peak load had second compressor been converted to motor drive, 48 per cent. It will be noticed that the load factor on group peak load is higher than on the individual

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mine peak load by 9 per cent., this is due to inter-mine working, and the group maximum shows a diversity factor of about 1·2 as against the sum of the maxima of the individual mines. Incidentally this is a point in favour of group control of mines and in this case should the shareholders wish to take control in their own hands they would find the increase in power cost over the 0·525d. rate due to working as a single mine £245 per month, and if the second compressor be electrified it would exceed £320 per month. On this mine had the compressed air plant remained steam-driven, a factor of about 70 per cent. would have been obtained on the rest of the mine supply, based on the group peak load hour. The load factor clause has resulted in each group of mines only electrifying a portion of the total plant, and on the group with which I am connected only about one-third of the total power requirements are supplied from the power supply system. If the whole were supplied the present group peak would be increased by nearly three times the kw. hours would be about double those at present purchased. The load factor would be decreased from 70 per cent. to 54 per cent. and the increase in price over the 0·525d. rate would be equal to £2,400 per month, due to load factor penalty. Regarding the compressed air supply, the mines obtaining air supply in the form of compressed air are in a very favourable position so far as the other groups are concerned. They obtain their air supply at a 0·525d. flat rate and have no capital cost of motor-driven compressor plant which amounts to about £15 per kw. installed with buildings at pre-War rates and would to-day be probably double that figure. The running cost per kw. of motor driven compressors, including power at 0·525 less 5%+2% for transformer loss together with driver's wages, attendance, lubrication and repairs, is on the average-sized compressing plant approximately 0·7d. as against a cost on steam-driven plants of the same capacity installed about ten years ago of 0·62d. As I have said before, on a totally electrified mine excluding compressed air supply the load factor for the remaining plant on any group will be about 70 per cent. on the group load peak, allowing a diversity factor of 1·2. Any power therefore required for compressor driving must be included in the cost sheet at the price of supply for the load factor of that air supply, and assuming this factor at 30 per cent., the price of which is 0·932d. per kw. hour, the cost per air unit will be approximately 1·1d., or more than double the price of the bulk air supply given by the Power Company. This means that in order to keep down mine costs, any air power required must be generated by steam power. Before passing to the subject of winding and cost, I think we may assume that the compressed air supply given by the Power Company at a factor of 30 per cent. to 35 per cent. does not permit of a large profit after allowing for capital charges, generating cost and upkeep on the compressor plant and long system of supply mains. On the other hand, I think that if the electricity were supplied at the present 70 per cent. rate for air supply of any load factor, there would be an increase in the electrically driven compressors on the Rand.

The next point for consideration is winding. For underground hoisting electricity is indispensable, but for surface winding, although the advantages of the electric winder are obvious so far as steady working and shaft maintenance are concerned, one point is worth some consideration that being the case of a deep level proposition with two shafts, each with two winding plants. If all four winders are electrified and there is a serious stoppage of supply due to some cause, such as the recent New Modder switch-house explosion, it may happen that the shift of white men and natives at work underground cannot be raised from the mine, and it would appear to be a safer plan to instal one steam and one electric winder at each shaft. If steam driven compressors are erected, the standby loss on the steam winder will not increase the working cost, and given some efficient means of thermal storage the waste steam can be utilised in exhaust steam turbines for boosting the air supply to, say, 1 atmosphere, and so increase the capacity of any existing compressor plant, or be used direct in an enlarged exhaust end of a turbine compressor.

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SOUTH AFRICA AND THE BRITISH IRON AND STEEL TRADE.

Exports of the United Kingdom—British South Africa—Some Valuable Figures.

The following figures reflect British trade with South Africa in the iron, steel and engineering sections:—

	NINE MONTHS TO SEPTEMBER 30, 1919.					
	QUANTITIES.			VALUE.		
	1917.	1918.	1919.	1917.	1918.	1919.
	Tons.	Tons.	Tons.	£	£	£
Iron or steel—Iron, wrought, bars, angles, etc.	2,152	1,400	1,944	36,679	25,481	43,412
Cast iron manufactures	2,437	1,245	2,253	51,186	34,993	72,932
Wrought iron manufactures	847	331	741	37,071	17,550	41,811
Steel—Bars, angles, rods, shapes or sections	4,157	2,209	4,062	194,602	125,927	131,255
Manufactures of steel or iron—Steel unenumerated	1,368	442	4,294	49,894	28,014	199,372
Rails for railway use	391	134	2,531	6,513	3,032	47,758
Chairs and sleepers	103	—	318	1,906	—	6,776
Railroad, unenumerated	280	234	3,488	7,230	8,174	59,675
Railway carriages for passengers—Parts thereof	—	—	—	7,965	3,371	3,468
Railway trucks (not of iron) and parts thereof	—	-	—	42,391	8,833	88,931
Unenumerated parts thereof	—	-	-	27,956	39,812	52,527
Push bicycles and parts thereof	—	—	—	86,604	81,402	80,780
Motor cars complete number	25	2	12	6,578	570	5,927
Motor chassis	-	—	3	—	—	1,940
Motor cycles and parts thereof	—	—	—	123,896	61,763	73,931
Wire	133	43	1,886	5,646	2,463	66,925
Wire manufactures	1,768	1,117	2,413	85,079	69,019	192,239
Galvanized sheets, flat or corrugated	213	45	7,179	5,194	1,652	219,965
Anchors, cables and chains	418	291	364	15,377	13,312	24,515
Tubes, pipes and fittings, wrought	3,305	3,215	5,721	123,907	116,856	261,920
Pipes and fittings, cast	2,950	6,425	16,919	27,928	60,872	201,896
Nails and rivets	527	269	544	16,605	9,273	24,519
Screws	112	71	381	7,329	5,564	34,213
Bolts and nuts	1,213	572	1,495	40,651	24,352	91,619
Machinery prime movers, except electrical rail locomotives	2,774	511	650	212,594	27,585	35,276
Agricultural	64	75	180	4,452	5,618	16,227
Unenumerated	199	183	466	21,576	27,211	52,224
Not prime movers, agricultural machinery	115	105	316	5,531	7,832	23,212
Mining	7,969	3,784	3,450	349,303	210,120	235,311
Unenumerated	2,834	1,782	2,817	168,906	144,636	318,121
Lead	381	110	158	16,143	5,045	6,632
Cutlery cwts.	1,655	2,170	1,562	36,368	63,285	58,088
Hardware	17,756	11,725	16,825	24,334	78,434	124,817
Implements—Tools	—	-	—	107,697	77,277	214,419

A PLEA FOR AN "A.I.D." ON THE RAND.

Engineers Advocate Application of one of the Lessons of the War to Rand Industry.

At a recent meeting of the S.A. Institution of Engineers several engineers, in discussing a valuable paper by Mr. A. M. M. Cooke on the materials used in aeroplane construction during the War, drew attention to the excellent work of the "A.I.D." (Aeronautical Inspection Department) and pointed out how useful some such body would be on the Rand. Mr. F. C. W. Ingle said that the most valuable lesson to be learned from Mr. Cooke's paper was the necessity of standards being set up. If the aeroplane industry found it necessary to lay down certain standards and specifications for material, he thought that the Rand industry would do very well if it had an A.I.D. of its own for the laying down of specifications and standards of materials to be used. For such a department on the Rand they had a nucleus in the Standardisation Committee. He thought that, if the Committee would set up standards, it would serve a useful purpose. Mr. Cooke's paper, in illustrating the necessity for such a thing in England in the construction of aeroplanes, was a lesson to the Rand which they should not be slow to follow.

Mr. W. Elsdon Dew, the President of the Institution, said that the Standardisation Committee of the Chamber of Mines had already accomplished certain work, and the subject of hoses was the latest question they had tackled. He hoped the results of the specifications would lead to the consumer being able to obtain what he required, and if an investigation department was also necessary to see that what was supposed to be delivered would be delivered, it would be the natural sequence to the specifications having been drawn up; but undoubtedly they had in the past in this country suffered from buying indiscriminately, probably buying without knowing exactly what they themselves required. He thought the time had really come when definite specifications could be drawn up for many of their requirements, therefore he had been very much interested in the different specifications that the Air Department had prepared for such articles as they had had to use, and the completeness of the information in those specifications had opened his eyes to the many minute investigations necessary to obtain the best in everything. He had had the opportunity of perusing some of those specifications and he hoped to be able to utilise the information gained therein for their own benefit in connection with the Standardisation Committee. He felt very strongly that the lesson that they had learned from the Air Ministry, and he thought from many of the other departments, in drawing up definite specifications was one that this country must not by any means lose sight of. It was so important and far-reaching that it would be a crime for them to neglect what has been done in that direction. He hoped that at the next meeting members would give their views on the paper.

THE YEAR WITH THE OCEANA CONSOLIDATED.

The report of the Oceana Consolidated Company for the year ended 30th June last states that the cash, together with loans and sundry debtors for land sold, etc., amounted to £121,809, an increase of £72,500 compared with the previous year. The amount held on 31st October, 1919, in War Loans and Government bonds was £72,880, at cost. Shares and debentures in other companies appear at £319,886, of which quoted securities stand at about £150,000 and unquoted at about £170,000. The quoted securities show a substantial appreciation as compared with the book cost, while the unquoted in the opinion of the Board are taken into the balance-sheet at a conservative figure. The net profit for the year is £58,737, which added to £29,719 brought forward shows a total profit of £88,456 available for distribution. No part of the proceeds derived from the extensive sales of land in the Transvaal has been included in the above figures. The directors recommend a dividend of 4d. per share, free of tax (equivalent to a distribution of over 9½ per cent., less tax), placing £25,000 to general reserve, bringing up that fund to £65,000, leaving £29,280 to be carried forward. Dividend warrants will be posted on or about 29th November. During the year the interest in the Douglas Colliery was realised at a profit of £28,837. Regarding the Palmarejo and Mexican Gold Fields, Ltd., an interest of £6,032 out of a total issue of £25,000 has been subscribed in bonds constituted as a prior lien on the whole undertaking, redeemable at a premium of 50 per cent. The Oceana Company also holds 37,559 fully-paid preference shares of £1 each and £37,846 in third debentures, which stand in the books at a nominal figure. In the Russian Anthracite Collieries, acquired originally in 1911, the company holds, at a cost of £104,318, 212,401 fully-paid shares of £1 each, £5,268 income bonds carrying interest at 6 per cent., and £16,829 seven per cent. debentures. Letters and cables have reached London reporting that the mine is undamaged and at work. High prices were being obtained for a reduced output of coal, sufficient to pay current expenses. The company's interest in the Taquah Mining and Exploration Company consists of 86,878 fully-paid shares of £1 each, costing £58,642, out of an issued capital of £349,979. The holding on 30th June last of the Abosso Gold Mining Company consisted of 72,074 full-paid shares of £1 each, costing £22,523 out of an issued capital of £400,000. Since the date of the accounts, this interest has been considerably reduced. The company's interest in the Piccadilly Hotel consists of £85,134 in six per cent. participating debentures and 185,187 1s. shares (about three-fifths of the total issued share capital), standing in the books at a cost of £101,503. During the year 122,351 acres have been sold on deferred payments at satisfactory prices, the mineral rights in each case being reserved to the company. By continuing to offer special inducements to suitable settlers and by co-operation in the development of the land increased demands followed, and have resulted in the sale of a further large acreage since the close of the financial year. At 30th June, 1919, the company held the freehold and mineral rights over a total of 881,870 acres in various districts of the Transvaal, and, in addition, the mineral rights over a further 211,984 acres. A total of 120,988 acres were under option to prospective buyers, and this land was producing a small revenue under lease. In addition, 17,493 acres were leased at low rentals, power of resumption being reserved should sales be arranged. The proceeds of all sales have been written off the cost at which the land stood in the books of the company with the very satisfactory result that the cost price of the remaining 881,870 acres of land available for sale at 30th June, 1919, had been reduced to about 4s. per acre.

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GOLD, CURRENCY AND BARTER.

Mr. Benjamin White, in the course of a lecture on the "Romance of Currency," delivered at the first meeting of the forty-first session of the Institute of Bankers held recently, said:—It is evident that currency as between nations generally has been divorced from the metallic basis which previously had been effective. Some nations, by altering the terms upon which they are willing to receive gold, and by other signs show that gold is inacceptable, that is to say, they regard it as at a discount to their currency; others, by their inability to produce gold for export, reveal that gold is at a premium to their currency. In fact the world has reverted to barter, and gold has become a commodity like wheat or pork, with the added disadvantage that it cannot be eaten. The sort of currency now in most request between nations is goods, not gold or silver; till the exhausted nations can produce sufficient of these—if business is to be placed upon a fair footing by normal exchanges—there must be an extension of credit. Whence can such credit be obtained? There is but one answer—from the United States of America. While Great Britain was pouring out her blood and treasure for the Allied cause without stint, this nation, already the richest in the world, was adding enormously to her wealth by supplying food and munitions to the combatants, until at length the Great Ideal drew her also into the Allied ranks. The War debt from the Allied nations to Great Britain exceeds by hundreds of millions the War debt of Great Britain to the United States. Hence it is no cause for shame but for honest pride that the gold standard is temporarily ineffective, because it is an historical witness to the supreme effort put forth by Great Britain for civilization. The prosperity of the United States of America has been built up in past generations largely because many hundred millions sterling of United States railway and other securities have found a free market in the United Kingdom. These formed at the time most of the currency material by which the then balance of trade was adjusted; gold shipments were trifling in comparison. If any international ideal is to be translated into practice, credit instruments must be the currency material by which the present adverse trade balance of the United Kingdom, due to no fault of her own, is to be temporarily adjusted. The claims of the nations, however, which have borne the brunt of the German onslaught upon the liberties of the world should, beyond all question, not be regarded from the standpoint of mere profit.

THE WEEK IN THE SHAREMARKET.

Strike Troubles and Holidays Affect Activity—Dividend Declarations—New Flotations.

THE good effect of the satisfactory dividend declarations has been offset by the strike at the Simmer Deep and the approach of the holidays. On Tuesday the market was closed, and Wednesday saw prices a little easier. By Thursday the strike trouble had begun to exercise an appreciable effect. Business at the opening on that day was confined to unlisted and outside stocks. Orion Diamonds were bought at 9s. 3d. and 9s. 6d.; African Oil at 23s. 9d.; South-West Diamonds at 10s. 6d. and 10s.; and Transvaal Silver and Base Metals at 45s., against letters of allotment. The Silver Options will doubtless be quoted separately. On the Call New Modders were firm and unchanged at £34. Meyer and Charltons were higher at 100s. buyers. Coronation Syndicates were better at 18s. 6d. sales, while Randfonteins, Springs and West Springs were unchanged. T.G.M. Estates were 6d. higher at 16s. sales, and Wolhuters 3d. at 5s. 9d. sales. Brakpans were 6d. lower, City Deeps 1s., Main Reefs about 6d., Cason Mines about 1s., E.R.P.M. 10½d., State Mines 2s. at 99s. 6d. and 99s. sales, Modder East 6d. at 30s. 3d., Kleinfonteins 3d., New State Areas 1s. at 32s. sellers, Rand Selections 2s. 6d. at 102s. 6d., S.A. Lands 3d., and Van Ryn Deeps about 6d. at 99s. 6d. sales and sellers, etc. Tin stocks were weak and lower; Leeuwpoorts at 30s. and 29s. 9d. sales, being 1s. 3d. down; Zaaiplaats at 8s. 9d. and 8s. 6d., about 1s. lower; and Rooibergs quoted widely without business. Crown Diamonds were 1s. 1½d. lower at 13s.; Frank Smiths higher on balance at 10s. 6d. sales and buyers; New Elands firm and unchanged; Roberts Victors 1s. 3d. lower at 18s. and 17s. 9d. sales, and Rouxvilles 1s. higher at 27s. and 27s. 6d. sales. S.A. Alkali were inactive at unchanged quotation. Pretoria Cements unchanged at 100s. sales, but Hume Pipes were lower at 22s. sales.

	Fri. 12th.	Sat. 13th.	Mon 15th.	Wed. 17th.	Thurs. 18th.
African Farms	16 6	16 6	16 6*	16 6	15 9*
Anglo-Amer Corp.	55 0	53 6	56 0	57 6	55 0*
Apex Mines	7 6*	7 6*	7 6*	7 6*	7 6*
Bantjes Consolidated	4 5	4 4	4 1*	4 9	4 6*
Blaauwbosch Diamonds	—	90 0†	—	—	—
Brakpan Mines	72 6*	72 0*	73 0*	73 0	72 6
Breyten Collieries	—	9 0*	—	—	—
Brick and Potteries	—	4 6*	—	—	4 9
Bushveld Tins	2 1*	2 3*	2 6*	2 6	2 9†
Cassel Coals	—	—	—	—	28 6*
Cinderella Cons.	7 0*	6 9*	7 6	7 0*	7 0*
City and Suburbans	7 9*	8 9†	8 3	8 6†	7 6*
City Deeps	65 0†	62 0*	64 0*	66 0	65 0
Clydesdale Collieries	29 6	28 0*	—	29 6	28 9*
Con. Investments	31 0†	31 0†	—	—	—
Con. Langlaagtes	23 0*	24 0†	25 0†	24 6†	—
Con. Main Reefs	13 3*	13 6*	14 0	14 0	13 6*
Con. Mines Selection	34 0	33 0*	33 0*	32 6	30 0*
Coronation Collieries	71 0†	71 0†	71 0†	—	71 0†
Coronation Freeholds	2 5	2 5*	2 6	2 3*	2 4
Coronation Syndicates	19 0†	15 0*	13 0b	18 0	18 6
Crown Diamonds	13 6*	14 3	14 4½	14 1½	13 0
Crown Mines	70 0	69 0*	—	71 6*	71 0
Daggafontein Mines	19 3	19 0	19 3	19 0	19 0*
Do. Options (4 years)	—	2 1*	2 3	2 6	2 0
Durban Rood. Deeps	—	—	—	7 0*	—
East Rand Coals	2 9*	2 9*	2 9	3 0†	2 9†
East Rand Deeps	1 3*	1 4	1 3*	1 3*	1 3*
East Rand Props	10 3	11 4½	12 3	12 4½	11 6
East Rand Debentures	£70*	—	—	£70*	£70*
Eastern Golds	—	1 8	2 0†	1 3*	1 3*
Ferreira Deeps	10 0*	10 6*	—	—	—
Frank Smith Diamonds	9 7	10 4	10 4	10 4	10 6
Geduld Props	60 0	59 6*	60 0	60 6	61 0†
Glencairns	1 0*	1 0*	1 0	—	—
Glencoe Collieries	—	5 9*	5 9*	5 9*	5 3*
Glynn's Lydenburgs	18 6†	17 6	17 6†	18 6†	17 6†
Government Areas	101 6	100 0	[illegible]	101 0	99 0
Jhb. Bd. of Executors	—	—	[illegible]	34 0*	35 0*
Jupiters	6 3	6 0	6 3	7 0	6 9*
Klerksdorp Props	2 0*	2 0a	2 1*	2 1*	2 2*
Knight Centrals	7 4	7 1*	7 3	7 3*	7 3
Knights Deeps	9 6†	10 0	[illegible]	11 0*	10 3*
Lace Props	20 0	20 3	[illegible]	20 6†	20 0

	Fri. 12th.	Sat. 13th.	Mon. 15th.	Wed. 17th.	Thurs 18th.
Leeuwport Tins	31 3	31 0	31 3	31 0	29 3
Luipaardsvlei Estates	5 0*	—	—	7 6†	—
Lydenburg Farms	8 9*	8 8*	8 6*	8 11	8 6*
Meyer and Charltons	97 6	—	—	—	100 0*
Middelvlei Estates	2 5*	2 6†	2 4*	2 4	2 5†
Modder B.'s	186 0	183 0	183 0	184 0	188 0†
Modder Deeps	53 0	54 6	55 0	54 9	54 9
Modder Easts	30 3	30 3	30 6	30 9	30 3
Do. Options (3 years)	11 3	—	11 3	11 6	11 3
Do. Options (4 years)	13 10½	14 0†	13 3*	13 0a	13 3*
African and European	16 0*	16 6*	17 6*	17 0*	17 0*
General Minings	10 0*	10 0†	—	—	10 0†
Hume Pipes	21 9*	21 9*	22 0*	22 3*	22 0
Natal Navigation Collieries	—	29 0*	30 0*	29 0*	—
National Banks	297 6†	297 6†	297 6†	297 6†	297 6†
New Boksburgs	—	2 3	—	2 0*	2 0*
New Eland Diamonds	82 6	82 6*	82 6*	83 0*	83 0*
New Era Cons.	12 6	12 6*	12 6	12 9	12 6*
New Geduld Deeps	2 4†	2 3*	2 6	2 4*	2 4*
New Heriots	9 0	8 0*	8 0*	8 6*	8 6*
New Kleinfonteins	13 3	13 3	13 9	13 9	13 6
New Modders	£34⅞	£33¼*	£34a	£34	£34
New Unifieds	5 6*	5 6*	5 9*	5 9*	6 0*
Nigels	—	—	—	6 6	—
Nourse Mines	14 6*	15 9	15 0*	—	17 0†
Pretoria Cements	—	101 6	100 0	101 0	100 0
Princess Estates	3 3	3 3*	3 6	3 0*	3 1*
Rand Collieries	—	4 3	4 0*	4 3†	—
Rand Nucleus	2 2*	2 2	2 1*	2 0*	2 1*
Rand Selection Corp.	102 6*	106 3†	103 0*	105 0†	102 6
Randfontein Deeps	6 3	6 0	6 0	6 0*	6 6†
Randfontein Estates	25 4½	25 6	26 0	25 6	25 6
Roberts Victors	18 6b	17 6a	19 0*	19 0	17 9
Rooibergs	8 3	8 3	8 9*	8 6*	8 0*
Roodepoort Uniteds	—	4 0*	—	4 0*	—
Ryan Nigels	—	—	4 2*	4 2*	—
Shebas	2 3*	—	—	—	—
Simmer and Jacks	7 6*	7 0*	7 6*	—	7 6*
Simmer Deeps	3 3	3 6	3 9	3 3	3 0
S.A. Breweries	50 0†	—	—	50 0†	—
S.A. Lands	7 0	7 0*	7 1*	6 11	6 8
Springs Mines	55 3	55 0	55 0a	55 3	55 3
Sub Nigels	20 3	19 0	20 0*	20 0*	20 3
Transvaal Lands	30 0†	30 0†	30 0†	30 0†	30 0†
Trans. G.M. Estates	15 3*	15 0*	15 6*	15 6	16 0
Van Ryn Deeps	100 0	99 6	99 6	99 9	99 6
Van Ryn Estates	18 0*	20 0*	—	—	—
Village Deeps	17 0†	15 6*	16 9	16 6*	16 0
Village Main Reefs	8 6†	8 6†	8 6†	8 6†	8 6†
Van Dyks	3 6†	3 3	3 9†	3 0*	—
West Rand Cons.	—	—	—	—	7 0†
Western Rand Estates	10 0†	9 6	9 6*	10 9†	9 0*
Witwatersrands	—	18 6	20 0†	—	19 0†
Witwatersrand Deeps	10 0	10 0*	10 6	9 6*	10 0
Wolhuters	4 6	5 6	5 9*	5 6	5 9
Zaaiplaats Tins	9 3*	9 0	9 0	—	8 6
Union 5 per cent.	£103¼	£103¾*	£103¾	£103¾	£104*
New States	32 0b	33 0a	32 6	33 0†	31 6*
Rouxville Diamonds	25 0a	26 0*	26 0*	26 6*	27 6
South Van Ryns	8 9*	8 9	8 9*	8 9*	8 9*
S.A. Alkali	26 0	26 6	28 0	25 6*	25 6*
S.A. Township	40 0*	—	42 0	—	—
Tudors	1 5	—	—	—	—
Tweefonteins	26 0*	—	—	25 0*	25 0*
Victory Monarch	41 3*	41 6	42 0*	41 6*	—
West Springs	24 0	23 10½	23 10½	24 3	24 0*
Do. Options	7 9	8 3*	8 3*	8 0*	7 9*
Union 4½ per cent.	£102*	£102*	£102*	£102¼*	£102¼*
Union 5 per cent. tax	£102*	£102*	£102½*	£103	£102½

*Buyers. †Sellers. aOdd lots. bEx London

Swaziland Tin.

The following are the results of the operations of this company for the month of November, 1919. Concentrate recovered, 25 long tons, estimated profit (taking tin at £300 per ton), £1,783, add adjustments in respect of previous shipments, £974, total, £2,697

The World's Production of Silver.

With the successful flotation of the Transvaal Silver and Base Metal Co., Ltd., the silver market becomes increasingly interesting for South Africa. The *Mining and Scientific Press*, of San Francisco, gives, in the accompanying table, the statistics of the world's production of silver, in ounces. It will be noted that the total output, which declined in 1916, as compared with 1915, has increased slightly during the last two years. The maximum output was 226,000,000 ozs. in 1911. Whereas the quantity produced in late years has varied but little, it will be seen that the value of the output has nearly doubled. The figures for last year are approximate. The reports of the United States Mint confuse Burma with British India, and Australia is not credited with the silver in the lead and zinc concentrates exported, so that it has been found necessary to make sundry corrections. Broken Hill alone contributed 8,300,000 ozs. in 1915, against the normal annual yield of 13,300,000, as in 1914. The increased output from Burma is due to the profitable activities of the Bawdwin mine of the Burma Corporation. Mexico shows a recovery, which will be accentuated this year by reason of recent favourable developments at Pachuca; likewise, the mines of Nevada are likely to do better on account of the discoveries at Divide. The silver from India, Rhodesia, and the Transvaal is a by-product of gold mining. It is hardly to be expected that there will be a marked increase in the quantity of silver produced this year, because the stimulus to the exploitation of the mines producing silver alone will not compensate for the decrease in the yield of silver as a by-product from the base metal mines, notably those in which copper is the principal metal.

	1915.	1916.	1917.	1918.
United States . . .	74,961,075	77,414,800	71,740,400	67,879,206
Canada	28,401,503	25,459,700	22,151,000	21,284,600
Mexico	39,570,151	22,838,400	31,214,000	40,000,000
Central America . .	2,920,496	2,602,500	2,369,500	2,300,000
South America . .	13,687,464	15,580,300	15,542,700	16,000,000
Total America . .	159,540,689	140,695,700	143,017,600	147,460,806
British India . .	284,875	280,000	275,000	270,000
Burma	285,112	977,121	1,793,659	1,970,503
Japan and Chosen .	5,148,404	5,878,400	6,922,500	6,600,000
China and others .	19,286	31,000	64,400	70,000
Dutch East Indies .	450,000	450,000	450,000	450,000
Total Asia . . .	6,187,777	7,616,521	9,505,550	9,360,503
Transvaal	996,379	968,900	950,000	900,000
Rhodesia	185,233	200,700	212,000	200,000
Congo & other Africa	6,427	33,400	32,000	32,000
Total Africa .	1,188,039	1,203,000	1,194,000	1,132,000
Spain and other Europe	9,276,930	8,477,800	8,123,000	8,500,000
Australasia	9,250,000	10,700,000	10,800,000	11,000,000
Ttl. output in oz. .	185,443,335	168,693,021	172,640,159	177,453,307
Ttl. value in dols.	92,138,249	110,763,837	138,934,217	171,721,569
Av. price in cents	49.684	65.861	81.427	96.772

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WRIGHT'S ROPES

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CORRESPONDENCE AND DISCUSSION.

Oil in the Vryheid District.

To the Editor, *S.A. Mining and Engineering Journal.*

Sir,—As the world's demand for oil is becoming greater than ever, it should be the aim of mining companies and money owners to find new oilfields and principally in South Africa, where already indications of this valuable mineral have been found. Now I may state that I have at present in my possession a good report from an experienced mining engineer as to the probability of mineral oil on a property in this district, being very similar to the formations at places in the Galician oilfields. I shall be glad to communicate with any sound company who is willing to undertake the required boring operations on this property. For further particulars apply to "OZOCERITE."

Gluckstadt, Vryheid,

2nd December, 1919.

Armstrong Whitworth Enterprise.

In the presence of a distinguished assemblage on Wednesday, November 12th, at the Scotswood Works of Sir W. G. Armstrong Whitworth & Co., Ltd., the steaming and trial of the first locomotive completed under the firm's re-construction scheme provided the occasion for an epoch-making ceremony in the industrial history of Great Britain. Shortly after 2 p.m. the guests gathered round the locomotive—an engine of massive proportions and strength—and Sir Vincent L. Raven, K.B.E., the Chief Mechanical Engineer of the North-Eastern Railway Company, for which it has been built, mounted to the footplate. Taking charge of the controls, he admitted steam to the cylinders. The locomotive moved forward on its first official journey which, although a short one, was its introduction to a long life of tractive energy and speed in the railway world. At the conclusion of the brief and simple ceremony the guests were conducted round the new locomotive works and boiler shops, to see for themselves the wonders worked therein during the past few months, and hear the story of the strenuous changes which had been made from the mass production of shells to that of locomotives, the first of which had been viewed that day. The credit for this rapid reconstruction and the whole organization of the new works must be given in full measure to the Manager, Mr. R. B. McColl. His energy, skill and experience are responsible for this magnificent achievement which has been carried out in so short a space of time, and in the midst of many difficulties. The thorough manner in which the equipment of the works has been carried out and the carefully arranged sequence of the manufacturing operations drew many appreciative comments from the guests, the greater part of whom were men whose lives have been spent in close association with the building of locomotives. The Chairman of Sir W. G. Armstrong Whitworth & Co., Ltd., in the course of some interesting remarks, stated that the new locomotive works were now the largest in the British Empire and would shortly be the largest self-contained locomotive works in the world.

AGENTS WANTED.

Old established firm, one of the largest MANUFACTURERS OF IRON AND STEEL PRODUCTS IN THE UNITED STATES OF AMERICA, is desirous of appointing a reliable house in Johannesburg to act as their representatives for the Union of South Africa, etc., on a commission basis. SPECIALITY—DRILL AND TOOL STEEL. Will be supported by extensive advertising. Reply, giving necessary references to:

"IRON & STEEL,"
c/o *S.A. Mining and Engineering Journal*,
P.O. Box 963, Johannesburg.

TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

The Strikes and Anticipations—Timber and Building Materials—Iron and Steel—Oils and Colours—The Chamber of Mines—Commercial Exchange—Trade Notes.

A SPECIAL feature of the week has been the ballot at the Simmer Deep, which showed a majority against working with a German down the mine. The trouble should be restricted to the Simmer Deep mine, and it will be interesting to watch how the tangle can be unravelled. Some merchants do not take a serious view of it, but others are considering a lot of possibilities thereon. However, it is a case of hoping for the best. On Thursday morning the question of the power station mechanics asking for more money created a much greater perturbation than the Simmer Deep, as the lights and the trams may be in jeopardy for the Christmas holidays. According to information received from a responsible man in the Municipality, a general meeting will be held to see what can be done to reduce the cost of living. One idea is for the Municipality to open or assist in opening food shops or stalls at various centres in town. The same gentleman says that until all other ways and means are exhausted there will be no trouble in the shape of strikes. Another important matter—in fact the most important of the day—is the further adverse margin in reference to the American exchange, which is practically stopping business between here and America. The last quotation for the English pound is 3 dollars 70 cents, which is 15s. 5d. A merchant said it was even lower than this according to private cables, and reference was made to our bankers, who stated at the beginning of the week 3 dollars 70 cents was the quotation. This great difference, showing a loss of 4s. 7d. on each pound between here and America, has brought things to a climax by practically stopping all heavy trading between these countries. A leading American indenting firm states that all their mills decline to take any further orders, for the present at all events. An importer of oils states that he cannot get any more turpentine or oils from America simply on account of the exchange. Take, for example, lard oil. It was sold here for 55s. per case of two 4's, but now cannot be landed at less than about 150s., consequently lard oil is out of the running for heavy machinery and other lubricating work and other oil substitutes have to be used. Of course the goods on the way will have to bear whatever exchange charges are existent when the invoices are presented through the banks. The fact is that this is a most serious state of affairs, and what is happening is that the more enterprising merchants are cabling to Britain to see what can be done, as our sovereign represents that amount in Britain, whereas in America it is 4s. 7d. less. As a set-off against this news, Great Britain and France are endeavouring to fix up a loan in New York, and naturally the two Governments will have to pay interest. The capital funds will be retained by Messrs. Morgan, the British and French bankers to be dealt with as directed; the primary object, however, is to pay for the foodstuffs required by the two Governments. This would do an immense amount of good in levelling up the exchange to as near normal as possible. Some experts think that this would check the price of our raw gold rising to the extent it has done lately. Others say that considering the enormous amount of paper money now in circulation throughout the world, it will take several years at least to find a sufficient backing of gold before the huge quantities of paper are materially reduced to a commercial basis. For example, none of the Dominions will allow their countries to be flooded with British paper money, and in the case of, say, £1,000,000 worth of flour being required from Australia, it will be no use for Britain to send over a few sacks of paper money in payment, as Australia would want gold or its equivalent in merchandise. Hence the question of exchange is one that is being more studied to-day than before this great devastating war which has upset the best of calculations.

TIMBER AND BUILDING MATERIALS.

The bald but still very important statement is made that deals 9 x 3 have advanced 2d. per foot on the Johannesburg market, and to-day the ordinary price is 1s. 10d. to 2s. for spot delivery. This advance is based upon the gradually increased cost at the coast for some time back, but through the keen competition in Johannesburg and hopes being entertained that the values might recede a little the Johannesburg market kept prices down upon that assumption, and maybe overkeen competition without much cohesion between merchants. It may be mentioned that deals are very scarce indeed and the comparatively few arriving from the coast from time to time are wanted for the older contracts. Flooring, 9¾d. to 10d.; ceilings, 6½d. to 7d.; clear pine, 2s. per foot, 12 x 1; imported doors, 6ft. 6in. x 2ft. 6in. x 1½in., 42s. 6d.; 6ft. 8in. x 2ft. 8in. x 1½in., 54s. Fair stocks of these are on hand, but windows, casements and other joinery made in South Africa are a long way behind the big demand. The latest news from the Baltic is that the Finnish stocks accumulated during the War have all been cleared to Europe and elsewhere, hence a scarcity. Within the last two months values have advanced in the Baltic £15 a standard. For future shipments when the Baltic is again open (from ice) the quotations are higher than those ruling to-day. Stocks in Sweden and Norway are on the scarce side, as the demands are great. Shipping freights are about the same, whereas they were expected to be slightly lower when the

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Baltic was closed for the winter season. A traveller just returned from a buying trip in Natal, the Cape and the Free State, states that sawing timber, especially the white pine, has advanced to 70s. per ton for sawing purposes. This represents 15 per cent. advance, and the local people are using it largely for building operations because of the high price of the imported timber. This wood and others are used largely for making boxes for fruits and all kinds of South African produce. The price of mining poles is up 10 per cent., viz., 35s. to 50s. a ton according to the diameter and, so far as Johannesburg is concerned, there is the extra 15 per cent. for railage. These various causes are expected to put quite a decent advance on the mining pole contracts next time the companies are in the market. Roofing iron, 28 gauge, is from 1s. 7d. to 1s. 8d. per foot. Second-hand timber and iron are scarce, whilst orders are plentiful.

Iron and Steel.

An extra large parcel of iron and steel of all sizes has been purchased by one of our merchants from the Ministry of Munitions, for which early shipments have been arranged. The advices from the same party state that manufacturers in England refuse to accept any orders for any definite delivery, as many of them have orders outstanding from 1916 and 1917 for home consumption. In this connection with reference to orders a leading manufacturer who has been in the habit of importing wire from America states that the mills there have stopped taking orders. The price of No. 8 fencing wire is 45s. 6d. a roll and stocks are plentiful. Another feature is that the Railway Department seem to be pretty hard up for steel plates, as they have sent out an inquiry circular to several firms asking what steel plates they have on hand and to arrive. Bar iron and steel are gradually advancing in price, and all the floating stocks are pretty well absorbed. Hardly any shipments have been reported from America and England, in fact only one shipment from America is known to be coming for certain. Second-hand goods are scarce. A yard was come across and the following prices were given: 16 and 20 lb. rails, £20 a ton; do. tracks complete, £22 10s. Some good points suitable for tracks were shown from £8 10s. to £10, and a few others down to £3. There was some 6 inch pipe 22 feet with couplings attached at 6s. 6d. a foot. Girders, channels and angles, £25 to £30 a ton.

Oils and Colours.

Property owners have been very busy in painting and furbishing their houses for Christmas, therefore all painters have been fully engaged, in fact there is a shortage of good brush hands. The feature of the week has been the demand for white lead and in a lesser degree red lead, as the world's markets are anything but well supplied and the manufacture of lead takes time to come to fruition. The market is up to £8¼ per ton in London, which has not yet been fully reflected in the South African quotations, because our stocks have been fairly plentiful. For the genuine quality the local price is 95s. per 100 lbs., and the retail is 1s. 3d. per lb. down to 1s. according to the quantity purchased. Turps is seriously handicapped by the American exchange, and for the best genuine a small bottle about eight to the gallon is 2s. 3d. each over the counter and for single tins 15s. per gallon is charged; 150s. for ten 1's and 125s. for two 4's. A turpentine substitute is quoted at 60s. per case of ten 1's. Linseed oil, both raw and boiled, is 70s. per iron drum of four gallons. Best salad oil from America is 155s. for two 4's., being a record owing to the drop in the exchange, which has checked buying very considerably, as it will cost 160s. to land here under present conditions, but regular traders must have a little to go on with to keep business stirring. Second quality is 125s. and South African nut oil 100s. Castor oil is 120s. two 4's, and second quality 110s. Pure olive oil is very high indeed, say 35s. to 40s. per gallon, as we have not had any from France for five years. However, the steamship "Hova" contains a shipment and is expected at Durban any day. To-day the market has risen sharply and the price in France is prohibitive for our market.

The Chamber of Mines.

What a new departure in proposing a paid President to the Chamber of Mines, and what a wise one! There is plenty of work for a man to regulate and control all the details of such an important institution, and undoubtedly it is too much for any member who has important matters in connection with his mining business. The way the present chief has been elected time after time is an excellent indication, as a matter of evolution, that continuity of service is a great requisite for such an important office. But it has not been fair to the group supplying the President, because of the odium often cast upon a company or group in dealing with the labour troubles. As critics in their haste so often impute the most sinister motives to the best of men, therefore the proposed new departure should be welcomed and so remove the office from the alleged capitalistic intrigues and the insinuations made when feelings run high and get out of control. The Labour Party should also be pleased, as at times the irresponsible vapourings have certainly not been nice in reference to some of their well-tried leaders.

Commercial Exchange.

Business is quiet, but the mines purchased a little more freely on account of the approaching holidays. The railways and municipalities buy once a month, and trading with them in the early part of December was quite fair, being slightly above the average of late. Hopes are entertained that after the accounts are made up from the mines at the end of this month business will be better, for although one hears of transfers of stores and machinery spares from one mine to another, yet the general run of stores must be getting smaller, as no mines have closed down, and be the managers ever so careful a certain consumption must take place. Several changes in the composition of firms are mooted for the new year, but particulars so far are meagre.

Trade Notes.

The Olifantfontein factory is making one gallon jars of earthenware with an ordinary cork stopper at 3s. each, and two gallon jars with screw stoppers at 6s. 9d. each. The demand is great, as these are substitutes for the big glass bottles that came before the War and were used for wines, vinegars, brandies and other liquors. The 2lb. loaf is now 1s. owing to the shortage of wheat in the Union. The Government are contemplating importing from Australia or the Argentine. The profiteering committees had pretty plain sailing over judging foodstuffs, but they now have hard nuts to crack in dealing with draperies and frocks, as to what is profiteering. The Canadian shipment of agricultural implements has arrived in Johannesburg, thus relieving the position of scarcity to a small extent. Another large warehouse is in the course of erection at the corner of Troye and Commissioner Streets for an American motor tyre company and accessories of all kinds.

Victory Monarch G.M. Co.

The Manager of the Victory Monarch writes: "A drive put in at 60 feet in main block shows reef going 10 dwts. over 78 inches."

C. D. LUCAS & B. E. WOLFE
Mining Engineers.
68, 69 & 79. Permanent Bldgs.
Johannesburg.
P.O. Boxes 6301 and 537.
Phone 4368.

RESULTS OF NOVEMBER, 1919, SURVEY EXAMINATION.

Total Men Passed ... .. 7 (four unconditional).
Other Students Passed ... 6
Students from other coaches Passed .. .. .. Nil

We have secured the larger proportion of the Overseers' passes, during 1919 and 1918. In the last (Sept.) Managers' examination we secured 50% of the total metalliferous certificates granted, and in the previous examination the larger proportion of the total passes. Write for particulars and class time table.

Company Meetings.

TWEEFONTEIN COLLIERIES.

The second annual meeting of the Tweefontein Collieries, Ltd., was held this week. In the course of the chairman's speech it was pointed out that 32,750 ordinary shares and 8,560 preferent shares shown in last year's accounts as under option at par had been taken up during the year, and the issued shares now stood at 433,250 ordinary, 83,566 preferent, making 516,810 in all issued, with 67,250 and 66,440 preferent still outstanding on option. The cash position of the company would be a strong one and the scheme for opening a third shaft on Tweefontein could be proceeded with when thought advisable. The past year had been one full of trouble and anxiety, beginning with the influenza epidemic which entirely stopper all work for some four days and crippled output for several months. They had two days' native strike later, due to a misunderstanding on the part of the natives in regard to white employes taking Labour Day as a holiday. The natives thought this was a strike of miners to get increased wages and that it was successful and they therefore thought they might try the same. It was peacefully settled wih the assistance of Colonel Pritchard and the W.N.L.A. officials and some police. Since then the natives had been quiet and contented. Shortage of railway trucks which had been a serious trouble for years was, owing to war conditions, worse than ever, and they lost output through this cause alone, estimated at 95,000 tons. Through these causes they lost a total of 127,000 tons.

There was every reason to look forward to better things in future, as truckage was certainly likely to improve before long, prices more especially in export trade were certain to improve, and one might reasonably hope that stores and native food costs would decrease during the year. They were already paying high wages to white employes,, the average over their white employes, exclusive of manager, being £35 per month cash, with perquisites such as coal, water light, sanitary and nominal rents worth further £3 to £6. 1919 white wages cost per ton sold were 50 per cent higher than 1914 figures. Native food costs and medical comforts were 120 per cent. higher. Through reduction of hours and maintenance of present pay the cost per ton might still increase, but this might be minimised if the output could be maintained in the shorter hours by increased mechanical efficiency. They were providing all such possible mechanical means to maintain output in shorter hours.

The total output sold during the year under review was 1,024,000 tons. They had definitely proved on Tweefontein and Waterpan approximately 50,000,000 tons best Middelburg quality coal with 150,000,000 second quality suitable for by product treatment. They certainly had 7,500,000 tons of first class quality coal, possibly a good deal more, remaining to be worked on the Oogies farms. Only some 30 per cent of the Associated Collieries' sales were open to immediate increase in price, the great bulk being under contract to mines and railways at a fixed price for some few years yet. While the Government and the Mines thus benefit, the collieries in these trying times suffer a temporary loss, but continually improved methods minimise this and tend to stimulate production.

Employes' Attitude.

Collieries had been averse to enlarging the vicious circle of increasing costs of living and had reluctantly raised even that trade open to increase and at that to the least possible extent. The Government, on the other hand, had raised various coal freights from 60 to 200 per cent. on former rates, so that their forbearance had not prevented a considerable rise of costs to the consumer. In discussing wages and other matters with their employes he had always found them sensible and reasonable, though undoubtedly out to get the best possible conditions for themselves. This attitude carried to excess might defeat their own ends by closing down the less profitable mines and thus reducing both employment and output. He would say to miners, "Avoid extreme demands and give employers time to adjust matters to meet demands agreed to be conceded at the earliest moment possible without entailing heavy loss on the collieries." Employes should remember they were the preferent partners in business, and they got a good wage and living conditions before anybody else got anything, and though shareholders might get nothing for all the large sums they had provided, the employes were never the worse. They had instituted a system of monthly meetings when representatives of employes were present and all matters of interest were freely discussed. If employes would not allow this to degenerate into an opportunity of continually asking for further benefits and advantages to themselves, but tried by practical suggestions to improve output as well as their own conditions, then he thought the innovation could only result in good. The great body of their employes were sound, sensible men, and he had confidence that the extremists would not be allowed to disturb the mutual good feeling which had always existed on their collieries.

GLYNN'S LYDENBURG, LTD.

The annual meeting of Glynn's Lydenburg, Limited, was held on Dec. 17 in the Board Room, Corner House. Mr. H. C Boyd presided, and there were also present Col. Sir A. Woolls-Sampson, Messrs. E. W. Smith, B. T. Bourke, A. Mackie Niven, M. Honnet, and Mr. J. Gau, representing 22,469 shares.

The Chairman said:—At our last annual meeting I referred in some detail to the ill effects of the influenza epidemic, which invaded the mine in October, 1918, and caused a severe reduction in the profit for that month. As a result of the greatly reduced labour force material losses were incurred for the succeeding three months. Throughout the year want of labour hampered all operations, and with a mild recurrence of the epidemic we suffered still more in this respect during the first two months of the current financial year; fortunately, however, during October and November there has been some improvement, and the profit for the latter month was very appreciably better at £2,776 on the old gold basis, costs per ton being materially reduced.

The tonnage milled last year fell to a little over 3,000 tons monthly, instead of nearly 4,000 as formerly, costs rose by 6s. 9d. per ton, and the yield decreased by about 9d. per ton. The net profit was reduced to £9,961; two dividends totalling 5 per cent. were paid, and the balance carried forward was £30,609, of which nearly £16,000 were net cash.

The manager's report deals fully with the mining operations during the past year. In Compound Hill, which supplied nearly one-third of the ore milled, development values were somewhat disappointing, but now show a slight tendency to improve. There is nothing further to report regarding the prospecting work from the south towards Compound Hill, the lode not yet having been encountered. In the Werf the work was confined to recovering the mine from the effects of the past floods, and no development was possible. Although the mine is still suffering from an abnormal quantity of water, it has now become possible to resume development, and we look for a steady improvement in conditions there. Owing to the nature of the ground progress with the Osborn Shaft has been unsatisfactory. The amount of tonnage to be drawn from Mill Hill and South Hill is now negligible.

The ore reserves at 31st July were estimated to be 108,546 tons, of an average value of 9.4 dwt., showing a reduction in tonnage of somewhat over 30,000 tons, an average value of .4 dwt. The reduced tonnage is due to the absence of fresh development in the Werf and to the fact that some 14,000 tons, which had been previously included in the reserves, had to be omitted, owing to the present high working costs. If, however, the present price of gold is maintained, this tonnage may still be mined at a profit.

For the four complete months of the current financial year the published results, which as you are aware take no account of the increased price for gold now being realised, show a profit of only £3,320, but allowing for an average premium of 17 per cent., and for the cost of realisation, we may reckon that the actual profit for the period is approximately £8,000.

Tht Board desires to record its appreciation of the services rendered by the consulting engineer, the manager and the staff generally.

I now beg to move that the directors' report and the balance-sheet and accounts for the year ended 31st July, 1919, be received and adopted.

The report and balance sheet were adopted.

The retiring directors were re-elected and the auditors re-appointed. The meeting then terminated.

ELANDSFONTEIN ESTATE CO.

Mr. D. W. Rossiter presided at the annual meeting of the Elandsfontein Estate Company, and in moving the adoption of the report of the directors said: The report and accounts which are before you for the year ended 31st October, 1919, afford practically all the information available. It will be noticed that on the revenue side there is an item "income tax," £3 17s. This arises owing to a rebate having been made by the Government in respect of a previous year, and the above amount to credit is arrived at on an adjustment which also provides for the past year's income tax. Rents, etc., viz., £138, compares with £62 for the preceding year, the increase being due to our having leased additional areas. Claim licences and other property charges, viz., £1,313, is higher than the corresponding item for the previous year by £127—this being due to increased municipal assessment rates. Briefly, the net result for the year was that £922 was carried to the appropriation account, which sum, added to the amount brought forward at 31st October, 1918, viz., £1,094, gave a total of £2,016 to the credit of that account. Out of this a 5 per cent. dividend was paid, absorbing £1,500, leaving a balance of £516 carried to the balance sheet. During the year we realised £100 worth of our investments in the Union of South Africa 5 per cent. Local Registered Stock, and this reduction is reflected in the balance sheet. The other items do not call for any notice. I now formally move the adoption of the report and accounts.

Mr. Desclayes seconded, and the motion was carried unanimously.

Alluvial Fields Returns for October.

The number of registered claim holders on the Transvaal diamond fields in October was 2,686, and the number of diggers who registered finds was 1,245. The total value of the stones found during the month was £159,095. It is announced that diamonds aggregating 23¾ carats and valued at £70 were found on the Modder B Gold Mine, Benoni. Further details are as follows :—

Name of Farm and District	Value.
Blesbokfontein, Bloemhof	£24,708
Bloemhof, Bloemhof	3,852
Boschplaats, Wolmaransstad	20
Biesueslaagte, Bloemhof	6
Bloemheuvel, Bloemhof	1,102
Cawoodshope, Bloemhof	386
Christiana, Christiana	1,009
Cyfergat, Wolmaransstad	2,338
Dievedraai, Bloemhof	2,289
Doernbult, Wolmaransstad	915
Diamantdoorns, Bloemhof	878
Eastleigh, Potchefstroom	2,489
Eerstebegin, Bloemhof	1,765
Goede Hoop, Bloemhof	34
Goudplaats, Bloemhof	415
Grootdoorns, Bloemhof	78
Holloway's Rust, Wolmaransstad	77
Italia, Bloemhof	812
Kareepan, Wolmaransstad	9,775
Kameelkuil, Bloemhof	30,378
Klipkuil, Wolmaransstad	542
Koppiesvlei, Bloemhof	385
Kafferspan, Bloemhof	16
Katdoornkraal, Wolmaransstad	293
London, Bloemhof	4,975
Leeuwfontein, Wolmaransstad	4,429
Mooifontein, Bloemhof	1,064
Middelbosch, Bloemhof	50
Mimosa, Bloemhof	320
Maroetjesfontein, Bloemhof	34
Naauwpoort, Bloemhof	716
Panfontein, Bloemhof	177
Plessisdam, Bloemhof	4,649
Palmietfontein, Wolmanansstad	49
Rietkuil, Wolmaransstad	36,786
Rietput, Bloemhof	400
Schoongezicht, Bloemhof	109
Sandringham, Bloemhof	269
Schweizer-Reneke	3,725
Syferfontein, Wolmaransstad	21
Vechtvallei, Bloemhof	595
Vuurfontein, Bloemhof	110
Vevenfontein, Bloemhof	193
Zwar tlaagte, Bloemhof	665
Total	£143,898
Kameelfontein, Pretoria	£7,553
Beynestpoort, Pretoria	6,539
Kalkfontein, Pretoria	452
Roodeplaats, Pretoria	318
Rietfontein, Pretoria	285
Franspoort, Pretoria	50
Total	£15,197
Modder B Gold Mine, Benoni	£70
Bultfontein, Ventersdorp	70
Total	£140

Diamond Digging.

The opening of the new portion of Swartlaagte has been looked forward to for many months past, but at last the weary waiters have been rewarded : and on Tuesday morning, at 10 o'clock, the time fixed been rewarded : and on Tuesday morning, at 10 o'clock, the time fixed gathered to hear the proclamation read, after which, the signal being given, the diggers and would-be diggers, ladies included, who were all formed up in line, pegs in hand, made the usual frantic rush to secure, if possible, the piece of ground they fancied. This new digging joins the old Swartlaagte, but has always been looked upon as the far richer portion. Hence the unprecedented rush to secure a claim at the opening. On the day of the opening only one claim can be pegged, for which a licence must previously have been obtained at the Mines Office. The latter is something new, and was not known to many of the diggers, who were not provided with a licence, and possibly could not have got one in the crush on Monday. The difficulty was, however, got over, and they were allowed to peg—it would have been a great hardship otherwise. After a period of seven clear days a further five claims can be pegged. A digger can only hold six licences on any one digging—a very wise precaution to prevent any one digger holding a monopoly to the injury of others. Swartlaagte lies three miles north of Bloemhof, by which it is bound on the south, only separated by a barbed wire fence on the boundary line. The newly-proclaimed portion of Swartlaagte is about 800 or 900 morgen in extent, over which there are many good shows of gravel. The owners have secured their claims on all the prospecting parts which are said to have yielded good returns. The farm is, however, practically undeveloped, and if it yields as well as it promises, it will, from its extent of surface gravel deposit, become a very large alluvial digging and support a good many diggers, for years to come. The old Swartlaagte has not yielded too well, vide diamond returns, but this is accounted for by the facts pointed out to me by a digger that it lies just on the outskirts of the New Swartlaagte. Some few diggers have, however, done well on Old Swartlaagte. May the new one eclipse it by a big return, say, by the 31st January, 1920.—(Contributed to the "D.F. Advertiser' and by J. H. H.)

The Sakalava Position.

A circular has been addressed to shareholders of the Sakalava Madagascar Proprietary Oilfields, Limited, in the course of which it is stated :—"At the special general meeting of your company held on the 28th of May last, your chairman intimated that in the opinion of the board the time had arrived when the question of the reflotation of your company with a working capital adequate to its requirements and the potentialities of the property, should be taken into serious consideration. Your board are of the opinion that the technical administration should be in the hands of some organisation possessing the necessary staff of highly trained experts in oil formations and the sinking of oil wells, as experience has taught them that engaging a manager and drillers and sending them to do the work without a strong and definite authority behind them, is courting disaster as the work accomplished under such conditions is out of all proportion to the cost. After some unavoidable delay your Board have pleasure in informing you that they have been successful in arranging that your deputy-chairman, Mr. W. P. Fisher, and another of your directors, Mr. Paul Dreyfus, should proceed to Europe as speedily as possible and they are now en route. Your representatives will endeavour to arrange for the reflotation of your company and the results of their efforts will be communicated to you in due course, and a general meeting of shareholders will be called as soon as there is any definite news to report, at which meeting the directors' report and balance sheet will also be placed before them. In regard to the progress made at No. 6 borehole, considerable time was unfortunately lost in accidents to the drill, but after cementing to shut off the water to test the oil sands, the manager reported there was no measurable flow of oil; however, acting on instructions, he continued drilling. Latest advices received from him give the depth as 2,480 feet, and for the last 500 feet, the formation was mainly white clay and sandstones. To prospect your property in a manner in keeping with the area held by you, your Board are of the opinion that a number of boreholes should be sunk simultaneously and this can only be accomplished by the employment of adequate capital and an efficient organisation."

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Notes and News.

Important Electric Trade Combine.

The electrical trade will be deeply interested in the latest British combine. The English Electric Co., Ltd., which was formed early this year and represents the amalgamation of the interests of Dick, Kerr & Co., Ltd., Coventry Ordnance Works, Willans & Robinson and the Phoenix Dynamo, has now acquired the Siemens works at Stafford. A working agreement has been entered into between the English Electric and Siemens Bros. which provides for the preferential exchange of the special products of each, and which will also enable the undertaking to compete for works of importance in the world market. Efficient and economic production at the various works owned by the combine may also be expected as a result of this union.

* * * *

Mashonaland Agency.

Under the presidency of Mr. H. L. Stokes (the chairman) the shareholders of the Mashonaland Agency, Ltd., unanimously passed the resolution for increasing the capital of the company, for the purpose of developing the ranching industry. The object the Board had in view in carrying out the reconstruction scheme of February, 1916, has been achieved, the shareholders having received regular dividends since that time: 3 per cent. for the seven months to September, 1919, 9 per cent. for the following twelve months, and 10 per cent. for each of the two succeeding years. The chairman claimed that the ranches of the Mashonaland Agency were the most satisfactory of any in Rhodesia. The losses have always been below the average, and the high rate of the natural increase has always been maintained, the company owning some 7,500 head of cattle, compared with 2,195 head in September, 1916. Further capital for development is needed, and it is proposed to raise the capital by £200,000, of which £56,256 will be issued forthwith—150,000 shares at the price of 7s. 6d. per share, to be offered in the proportion of one new to three old, with a year's option on two for one year from January 1 next.

* * * *

The "Goldfields" Report.

Extracts from the annual report of the Consolidated Goldfields appear elsewhere in this issue. As usual, the report contains an interesting review of conditions in South Africa and elsewhere. It is in the Union where results have proved so disappointing, and though much real benefit should be derived from reduced prices of materials and stores and the premium on the sale of gold the position as regards some of the mines under the company's control continues to give cause for anxiety. Especially is this the case with the Simmer Deep. The industry still has heavy burdens laid upon it, and apparently the authorities are by no means sympathetic. The native labour position seems to be improving, though permission to recruit north of latitude 22 degrees south would be of immense benefit, while the removal of the colour bar would greatly stimulate the activities of local natives. The summary of the position by the company's representatives at Johannesburg is interesting to a wider circle of investors than those to whom it is immediately addressed, and is worth quoting: "To sum up, we look forward to a slow, but gradual, improvement in conditions affecting mining, dependent largely upon sympathetic treatment from the Government and the extent to which, by special effort on the part of our engineering and mining staffs, we are able to improve efficiency. The immediate factors governing the possibility of continuing profitable operations on the poorer mines and enabling them to be re-established firmly as profit-earners are (a) the measure of relief, if any, the Government will concede as a result of the recommendations of the Low Grade Mines Commission, and (b) the extent and period during which the international exchange position will enable the gold producers to obtain a premium on their gold."

Company Change: A Correction.

A regrettable error in our last issue made it appear that in addition to the Anglo-French Exploration Company's interests in the Anglo-French Navigation Colliery at Blackhill passing under the control of Sir Abe Bailey's companies, the Anglo-French Exploration Company itself had likewise been transferred. This, of course, is incorrect, as no change has been made in the control of the Anglo-French Exploration; and naturally we much regret the mistake.

* * * *

Surveyors' Examination: A Correction.

Owing to a printer's error in an advertisement in our last issue, the results achieved by the students of Messrs. C. D. Lucas and B. E. Wolfe, of Permanent Buildings, were incorrectly stated. Out of a total of seven passed at the recent Survey Examination, six were students of Messrs. Lucas and Wolfe—a very gratifying result in view of the fact that they entered only seven students.

* * * *

Middelburg Steam Coal and Coke.

The report of the Middelburg Steam Coal and Coke Company for the year ended 30th June last states that the output of coal was 281,666 tons, as compared with 274,802 in the previous year. The output would have shown a further increase but for the scourge of influenza, which was especially virulent in the Transvaal and necessitated the closing down of the colliery for 11 days. The prices of stores and materials continue to rise, and demands for increases in salaries and wages are periodically made by the associations and unions of which the various grades of officials and men are members. It is hoped that the Transvaal Coal Owners' Association will be able to secure an increase in the price of coal to meet the additional costs of mining. Alterations to the existing plant and machinery and additions thereto have been carried out in order to secure more efficient working and increased output, and it is believed that the current year's working will show a substantial improvement. During the year the purchase of the freehold surface rights of 400 morgen was completed; a further 30 acres has since been acquired. The sum of £8,459 was expended during the year on these improvements and the purchase of land. The trading profit, less depreciation, etc., and with £7,429 brought forward, amounted to £24,104. A dividend of 3¾ per cent. on account of the year to 30th June last has already been paid, and it is proposed to pay a final dividend of 3¾ per cent., less tax at the rate of 4s. 3d. in the £, making 7½ per cent. for the year. The usual provision for depreciation has been made.

* * * *

The Future of S.-W. Diamond Fields.

Dr. P. A. Wagner, in his well-known work, "The Diamond Fields of Southern Africa," dated 1914, writes as follows with reference to the future of the South-West African detrital deposits:—"Notwithstanding the fact that an enormous amount of prospecting work has been carried out by the different companies, no important gravel deposits have been discovered in the littoral of German South-West Africa since 1910; and the area of the field is, therefore, not at all likely to be increased. With regard to the claims now being worked, it may safely be affirmed that, except in so far as the Pomona area is concerned, the cream has been skimmed; or, in other words, that the richest and most accessible areas of gravel have been worked out. The deposits in the Ida Tal at Pomona, while of phenomenal richness, are very shallow and of limited extent, and their importance appears to have been greatly over-rated. As against the foregoing there can be no question that vast resources, in the form of low-grade gravel, are still available; and now that the exploitation of this material has been rendered feasible by the new method of taxation, and the Government has wisely decided to keep the output within reasonable limits, a long and prosperous career may confidently be predicted for the South-West diamond industry."

Million and a Half Iron Proposition.

Mr. A. C. Romyn had something of interest to say at the annual general meeting of shareholders in the Pretoria Iron Mines, Ltd., held last week. In regard to the future development he stated that for some time negotiations had been carried on with a big financial institution for the flotation of a company with a capital of £1,500,000. Although these negotiations were very far advanced, he was not to-day in a position to give further details. All he could say was that they would be satisfied with the way their interests were being safeguarded. Nothing would, of course, be decided without their sanction. The directors hoped to conclude the negotiations at an early date, when a special general meeting of shareholders would be called to consider and deal with the matter. In general the outlook for the iron and steel industry in South Africa was very bright. It was at first thought that after the conclusion of the War the prices for iron and steel manufactures in Europe and America would drop very considerably. That had, however, not been the case. The prices were still very high, and it could safely be assumed that they would never come back to pre-War prices in these countries. They were therefore in a very favourable position with their abundance of cheap iron ores and fuels. He would not be surprised if it were found possible, if once the industry were started on a large enough scale, that they should find it profitable to export the surplus of their product, if not to every part of the world, certainly to a very great portion of the Southern Hemisphere. It was satisfactory to note that a general keen interest was taken throughout South Africa in the inauguration of the industry, and that Ministers had referred to it in many of their public speeches. That gave him confidence that from the Government they might expect such assistance as was due to that very important industry.

* * * *

Rhodesia Consolidated and the Far East Rand.

The report of Rhodesia Consolidated, Ltd., for the year ended 31st March last shows a profit of £1,456. As, however, the Insiza Mines, Ltd., has now been finally wound up, the cost of this holding, which, together with a small loss on sales of other investments, amounting in all to £32,394, has been charged to profit and loss, there is left a debit balance on that account of £30,938. From this amount the balance of profit brought forward of £9,525 has been deducted, leaving a debit balance of £21,413 to carry forward. 26,717 acres of land have been sold during the year at an average price of about 5s. 8d. per acre, giving a profit of £892. On 31st March last the company held 426,958 acres, standing in the books at 5s. per acre. No stands have been sold, the number owned at 31st March being 26. The company holds 65,380 shares in Falcon Mines, Ltd., out of an authorised capital of £600,000, of which £400,000 is issued. Asp—This company has given an option of purchase over its property in consideration of development work being carried out by the option holders during a period of two years. The work so far carried out by the option holders has given satisfactory results, and has considerably increased the value of the mine. Rand mining claims—In accordance with the wishes expressed by shareholders at the last annual meeting, instructions were sent out to South Africa for a report to be obtained as to the best policy to pursue regarding the claims held by the company on Farm Vogelstruisbult. The engineer who was selected to report (Mr. C. E. Knecht) recommended the sinking of a borehole, and as any information which might be derived from such a course would be of equal value to the owners of the neighbouring properties, steps were taken to obtain their views and to ascertain if they would be prepared to contribute towards the cost of the proposed borehole. The directors also endeavoured to obtain an option over the other claims on Farm Vogelstruisbult in view of the opinion expressed by Mr. Knecht that the estimated profits from the company's holding would not cover the estimated capital requirements. None of the other parties, however, are willing to join in the cost of a joint borehole, nor can an option be obtained over the other claims. The directors do not propose therefore, in the circumstances, to take any steps at present as regards the proposed borehole.

Mining Men and Aviation.

A prominent Rand mining engineer, who availed himself of local aircraft facilities to make a trip from Johannesburg to Brakpan is extraordinarily optimistic regarding the new mode of travel. In his opinion the East Rand can use aeroplanes to a greater advantage than is popularly supposed. To use his own words, "I am impressed with the usefulness of planes in every commercial field, especially in connection with the East Rand mining area, and I recommend every mining company to lay out a landing ground so that, when necessity arises, the management can fly to and from the property. Once provided with aerodromes there should be no difficulty in forming aero clubs, so that, eventually, every man his own aviator, will be a fact instead of a joke. Just imagine how quickly small mechanical essentials may be replaced on the mines, and if we can aeroplane them to the scene of breakdown such facilities may easily mean the saving of hundreds of pounds per hour. Some say flying is expensive. It may be, but it only requires to be made use of to become cheaper. Special trains are expensive, and only millionaires can afford steamships, and small ones at that. In Canada, America and Australia the aeroplane is applied to pastoral inspection, transport of compact and valuable freight, prospecting, survey of timber lands, and for general transport in places "at the back of beyond." In post-war days time is more valuable than ever, and the business man who can go, or send a trusted representative to fix up a business proposition or deal with the unexpected will have a pull over his old-fashioned or more conservative competitor, who is content to adopt eighteenth century methods. The aeroplane is the only instrument that makes hustling possible, and we shall need to hustle in these days of the shilling loaf and butter at 4s. per lb. If hustling does not prove the aeroplane a necessity what does?

* * * *

Wankie Coalfields of Rhodesia.

At a recent meeting of the Midland Junior Mining Engineers, held at Sheffield University, Major B. Lightfoot gave a Paper upon the "Wankie Coalfield of Rhodesia," in the course of which he showed that the coal was not of the same age as English coal, but was formed whilst the Permain and Triassic rocks were being formed. The coal was only formed in the deepest hollows. It was formed in big lakes in these hollows, and later all was covered up by the forest sandstones. The structure of the floor consisted chiefly of granite and schist belts, in which were found all the gold mines. The haulage was so great that Wankie was the only developed coalfield, and this had 212 miles haulage to Bulawayo. The mine was still the only coal producer in Rhodesia. The coal was of an excellent quality, and had a high calorific value, being superior to any Transvaal coal, equal to the best Natal and American coal, and, but for its high percentage of ash, would be equal to Welsh coal. Taking the average of twenty-one analyses, the following was shown:—Fixed carbon, 66.13 per cent.; volatile matter, 20.38 per cent.; moisture, 0.88 per cent.; ash, 10.61 per cent.; sulphur, 2.00 per cent. Calorific value, 13.23 lbs. of water evaporated. As the reserves of coal in the area were far ahead of present requirements no attempt had been made at the colliery to make a definite estimate of them. Mr. A. R. Thompson (general manager at the colliery) estimated that the coal extended through a low-lying area between the mine and the Dekka river, a tract roughly 25 miles in extent. He deducted losses in working, and allowed 4,000,000 tons of coal per square mile, so that there would be 100,000,000 tons in this area alone. Mr. H. B. Maufe gave 201,200,000 tons as the reserve in the area. It was estimated that coal was to be found throughout an area of 150 square miles without the limits of the field being reached in a north-easterly direction. This would raise the estimate, adopting Mr. Thompson's, for the amount of coal per square mile to 600,000,000 tons. In view of the immense reserve of coal still existing at Wankie, it was not likely that any attempt would be made to prove the possibility of a concealed coalfield, but if ever such an attempt were made the structure brought out by the mapping of the Wankie coalfield should be borne in mind in selecting sites for boreholes.

TOPICS OF THE WEEK.

LABOUR QUESTIONS AT THE YEAR-END.

Labour questions bulk largely at the end of the year. Up to the time of going to press, the Simmer Deep trouble remains unsettled, despite the efforts of Sir Evelyn Wallers and Mr. D. Christopherson to submit the trouble to a Board of Reference. The Mine Workers' Union, alone of all the parties concerned, has up to the present stood in the way of the appointment of such a board, and is therefore the cause of the prolongation of the struggle. Possibly, however, before this appears in print, a settlement may have been reached as the only alternative seems to be the closing down of the mine. Further substantial concessions have been made to mine employees in the matter of increased wages, and the President of the Chamber announced on Monday that the question of shorter hours was being discussed with the men. The chief point was to convince them that any further curtailment of the already brief working shift of the natives underground would react upon the white men themselves. The President of the Chamber in his end-of-the-year utterance shows himself, despite recent criticism, as firm a believer in Boards of Reference and a "give and take" policy as ever. Of the recent conference at Pretoria he is able to speak encouragingly. "Whilst it is true that it took a few days of the first sitting for both sides of the Conference to realise and make allowances for each other's points of view," he said, "it is equally true that during the latter part of the first sitting and the whole of the final meetings, a considerable degree of mutual understanding was in evidence, and there is no doubt that such a Conference cannot fail to be of benefit to the carrying on of the various industries in this country." In this connection, it is noteworthy that of the recent gathering at Washington the *Mining and Scientific Press* says: "The failure of the National Conference is little short of a calamity, and Secretary Lane's plaintive letter to the President asking for a new one shows that the Administration at Washington recognises the seriousness of the failure. The reasons for the miscarriage of a good purpose are fairly obvious. In the first place, no agenda or programme had been prepared, so that there was nothing to steer the conference away from the rocks of bitter controversy on which it suffered shipwreck. Next, its personnel was ill chosen. Moreover, although organised labour was well represented, the larger mass of unorganised labour, including the professions, was not represented at all. The Conference became little more than an arena for debating the chief issue involved in the steel strike, namely, 'the closed shop' and 'the open shop.'" From some quarters, of course, much the same sort of criticism was directed against the Pretoria Conference, but the main body of opinion appears to be in accord with that of the President of the Chamber of Mines. Largely owing to the increase in the work of the President entailed by labour questions, the Chamber is to have in Mr. H. O. Buckle, a paid chairman in future. The new arrangements were thus explained by Sir Evelyn Wallers: "It is in regard to the position of the President of the Chamber that it is necessary to make other arrangements. Never, I am sure, has any man been more ably or more loyally supported by vice-presidents than has been my fortunate experience during the five years that I have been President of this Chamber. They know how grateful I am to them, but even so, they know, too, that extraordinarily interesting though the work is, the burden for several years past has been greater than can reasonably be expected from anyone holding that position in an honorary and part time [illegible] and with many other duties to perform. There has, in reality, been little of a part time character about it, because the work has grown so much, particularly on the industrial side, that certainly three-quarters of my working hours have been spent on it. The executive committee therefore agreed that the time has arrived when a whole time and paid President or Chairman of the Chamber should be appointed." In Mr Buckle, need we say, the Chamber has found the right man for the post which is every year becoming more exacting, inasmuch as it has to deal with problems ever becoming more numerous and complex.

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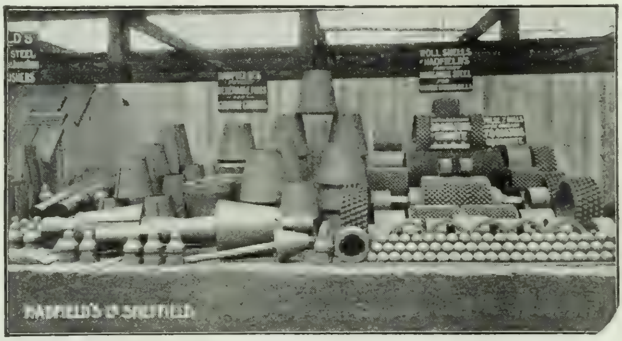

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STIENIE DIAMONDS.

An Interesting Free State Venture—Encouraging Results Secured.

Since the revival of interest in the diamond market much activity has been displayed in the Theunissen district of the Orange Free State. A few miles to the north of this township (formerly known as Smaldiel) and in close vicinity to the main Johannesburg-Bloemfontein railway line are the old Driekoppies mine, the Lion Hill workings and various other prospects which engaged much attention a good many years ago. More recently this area has come into prominence as being the locality in which the properties of the Monteleo, Theron, New Thor, Compound, Percy and Stienies diamond companies and syndicates are situated.

Mines and Fissures.

This area is heavily fissured and in some sections the width and diamond contents of the fissures have been of a sufficiently favourable nature to admit of results which with diamonds at high prices have been of a payable nature. Much of this area is covered by dioritic and basaltic sheets and in other places shale has formed a cloak of overburden which has concealed diamond-bearing rock, and despite a large amount of costeaning and sinking of shallow shafts recent operations have failed to disclose what exacting critics would term a "mine" in the strict sense of that word as applied to the "pipes" of diamond mines.

There is, however, a widely-held belief amongst men thoroughly experienced in the various diamond fields of South Africa that somewhere along this line of earth fracture there is an occurrence of kimberlite on a much larger scale than has ever been located in the fissures, and that the large amount of diamondiferous wash in this locality has been shed from a "mine." To locate such an extensive occurrence is very naturally the dream of every prospector in this area, and the great hope which has buoyed up numerous syndicates in financial jeopardy to persevere with the new drive, the next trench or the last pit. There is, *en passant*, a definition of a mine other than that adopted in Government regulations—an American definition which has it that "a mine is a hole in the ground owned by a liar." We fear it must be admitted in the light of past history of this portion of the Free State that the somewhat harsh criticism contained in this definition has sometimes been justified. It is too indisputable that market prices have often been a greater consideration than actual discoveries. There are, however, to-day several concerns which have been for some time and are at the present day making genuine efforts to establish permanent discoveries in this area. Amongst such is the Stienies Diamond Syndicate, Ltd., which is carrying out work in two areas under the capable direction of Mr. Beddy, one of the best known and most experienced diamond prospectors in the country.

The Stienies Rust Area.

This syndicate has a capital of £30,000 in 5s. shares. The original Stienies Rust proposition, known at first as Beddy's Prospect, lies about nine miles from the township of Theunissen. It is on a line between the New Thor, Compound and Monteleo properties, and was some time ago reported on by Messrs. Minett Frames, W. Seeley and Joseph Gouldie. Very extensive work has been carried out here. In the first place a large area of "wash" has been located extending about 4½ miles to the north, and by following this up occurrences of yellow ground were discovered on the farm Stienies Rust at the foot of a large elongated hill which consists mainly of diorite. Two occurrences which differ somewhat in petrographical features have been located here, and both Mr. Seeley and Mr. Gouldie expressed the opinion that the discoveries were sufficiently attractive to warrant the expenditure of a certain amount of capital. Since those reports were made a further large amount of exploratory work has been carried out and the existence of two areas containing kimberlite has been established.

The relationship of these two occurrences the one to the other must remain a matter for conjecture until more work has been accomplished, but it is clear that an occurrence which may best be described as a kimberlite dyke traverses the property, whilst there are indications that in a portion of the area the kimberlite occurrence is of a width which almost justifies its description as an elongated "pipe." It may be best to consider these areas as two separate workings. The so-called No. 1 workings have yielded as much as 10 carats to the 100 loads, and there are 100 to 150 loads of blue and yellow ground on the floors for washing. All the water available is, however, required for the drilling operations which are proceeding in the No. 3 borehole on what is known as the No. 2 area. In this borehole a diamond was recovered in the sediment, and at the time of our representative's visit to the property the bore was down to a depth of 281 feet and appeared to be just getting out of slate into fractured and mineralised ground. Just as we go to press we learn that this borehole has encountered 70 feet of kimberlite. It is reckoned that on this No. 2 section five claims of kimberlite have been located.

Driehoek.

Further west the fissure has been followed into Driehoek and right up to the boundary of the New Thor mine. At one place on Driehoek the occurrence is 93 feet wide, and there is a persistent line of fissuring with yellow almost at surface here. Elsewhere, however, there is heavy overburden, which renders prospecting operations difficult.

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There are, however, abundant evidences of the existence of true kimberlite on this Stienies Rust-Driehoek section along a line of earth cleavages which has been opened up for not less than a mile. Moreover, the kimberlite contains diamonds and the indications are that the Stienies Rust-Driehoek occurrences are of payable character and might by subsequent exploration be proved to constitute a diamondiferous area of very considerable importance.

The syndicate has secured a three years' contract over Retreat, which is 1,100 morgen in area. The recovery of diamonds from Retreat has been $52\frac{3}{4}$ carats from 149 loads. This includes one stone of $5\frac{1}{4}$ carats and one of 5 carats, and $29\frac{1}{2}$ carats have been valued at £350. The syndicate commenced working here about October 10th last. The Stienie Company also has the option to purchase Mooipan, which adjoins Retreat on the west.

Prospecting on "Retreat."

In connection with operations on Retreat it may be as well to recite a little past history of this section of the country which came into prominence more than 30 years ago on account of discoveries on the farm Blydschap in this area. Diamonds were first found here in 1884. A rush ensued and the farm was surveyed by Mr. Gustave Baumann, the O.F.S. Surveyor-General, for a syndicate. The diamonds were of excellent quality, and it was thought that a discovery of the utmost importance had been made. It was, however, afterwards found to be only alluvial. Some years afterwards a Mr. Brunton followed the wash right up to Smaldiel, which is now a portion of the farm Mooipan. At the end of 1902 Mr. Beddy washed at Blydschap and found 172 carats from the wash and also followed the wash up to Smaldiel, but east of Smaldiel he found no more deposit. As long ago as 1903 Blydschap Diamonds were valued at £5 a carat, and the produce would to-day command a much higher figure. After 1902 nothing was done in this locality until the other day, when the Stienies Syndicate commenced working on Retreat. Previously to this no kimberlite had been found west of the old Driekoppies mine, which adjoins Retreat on the east, but during the past few weeks the Stienies Syndicate has discovered a fissure which has been opened up along a line of strike of 225 yards, whilst the workings on this have been connected up for 85 yards. Three levels have been opened out, of which the lowest is at 50 feet, and at this depth the fissure shows distinct signs of widening. The average width so far disclosed is at least 6 feet, and it is worth noting that at the western end of the fissure boulders are in evidence and there are other favourable signs to be observed. To the west of the workings on Retreat is a large pan, and in this pan there is diamondiferous deposit on surface. This pan is on exactly the same line as the farm Smaldiel referred to previously in connection with the Blydschap prospecting operations. There is a diabase dyke striking north and south across the country west of the pan, and a belief is held that at the point of contact of dyke and fissure there will be a very material enlargement of the fissure. This view the syndicate will test by continuing prospecting operations westwards. Washing is proceeding with one 6 ft. pan and 18 to 20 boys are employed on the property. The deposit, it may be remarked, is of very attractive appearance and "lively" mineralisation. It contains a very large proportion of garnets, is heavily micaceous and contains olivine and iron pyrites in fair quantities. The further prospecting of Retreat is certainly justified by the results secured to date and future development should prove exceedingly interesting.

Machavie,

In reporting the speech from the chair at the Coronation meeting last week, we should have pointed out that the process referred to as having been successfully applied to the Machavie mine was worked out by Mr. E. J. Way.

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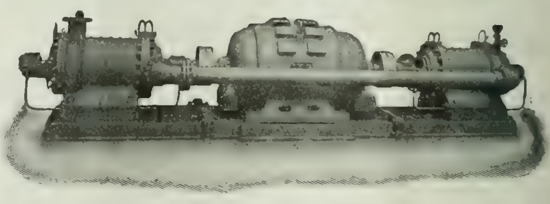

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THE YEAR WITH THE CONSOLIDATED GOLD FIELDS.

Mining and Financial Conditions Reviewed—The Low Grade Mines' Position—Points from the Annual Reports.

The report of the directors of the Consolidated Gold Fields of South Africa, Ltd., or the year to June 30 last states that the debenture issue has been further reduced since June 30 by the drawing of £25,000, leaving the oustanding debentures at £25,000. The realised profit on the year's operations is largely derived from dividends received on investments, and, after deducting debenture interest and all outgoings, shows a balance to credit of £544,107, from which the dividends on the first and second preference shares, French, South African, and American Government taxes have been provided, leaving £388,962. Against this profit a depreciation of £194,335 has been charged in order to reduce holdings to market price in the case of quoted securities, or to their estimated value in the case of unquoted securities. To the remaining balance of £194,627 has been added £60,095 brought forward from last year, showing an available balance of £254,722. In addition to the foregoing realised profit the company's investments show, on current prices, and on an estimate of unquoted investments, a further large unrealised profit. Investments stand in the books at average cost or under, and are taken into account at prices at or below those current at the date when the accounts were made up. The directors recommend that a cash dividend of 7½ per cent., free of tax, be paid on the 2,000,000 ordinary shares, amounting to £150,000, leaving £104,722 to be carried forward.

New Consolidated Gold Fields, Ltd.

On July 22, 1919, a circular was issued to shareholders convening an extraordinary general meeting of the company to consider a resolution authorising the sale of the assets of the company to a new company. The directors recommended the shareholders to agree to this course, as they were constantly refusing offers of remunerative business, which under the memorandum of association they were debarred from entering into owing to the fact that the objects of the company as set out in its memorandum were unusually limited, and did not afford adequate scope for the remunerative employment of the company's capital. At the extraordinary general meeting held on July 31, 1919, the resolution was duly passed, and on August 8 New Consolidated Gold Fields, Ltd., was registered and received its certificate to commence business on August 27, 1919. Although the company's assets will be transferred to and become vested in the New Consolidated Gold Fields, Ltd., the directors have decided that the company shall continue its corporate existence for the purpose of holding the whole of the share capital of the new company.

Transvaal.

The continued high cost of mining material and shortage of native labour during the year mainly account for the company's reduced revenue from dividends. Although hampered by these adverse factors and also by the obligation of the mining companies to dispose of their gold under the then existing agreement, every effort was made by the management in South Africa to avert the threatened closing down of the low-grade mines under the company's control. It was hoped that speedy relief by the Government of the Union of South Africa might be forthcoming and that the necessity of abandoning the mines in question might thus be avoided.

The Gold Production Committee appointed by H.M. Government in September, 1918, having reported against the suggestions for relief made by representatives of the gold producers of the Empire, and against the granting of assistance to the gold-mining industry in any form the Government of the Union of South Africa, upon strong recommendations made by the Witwatersrand Chamber of Mines, in May last appointed a "Low Grade Mines Commission." As the result of its inquiry this commission has presented a report, upon which, up to the present, the Union Government has taken no action. In July last, however, an understanding between the gold-producers of the Transvaal and Rhodesia and the Bank of England was arrived at, and an arrangement was come to whereby a free market for the gold produced in those countries is for the time being ensured. The results of gold sales up to date give hope that the ameliorated position of the low-grade mines thus created will, owing to the higher price obtainable for their product, enable them to overcome the difficulties still existing as regards high working costs, heavy taxation, and shortage of labour; but there is at present no evidence that the Government of the Union of South Africa views these mining difficulties sympathetically. The imposition of an amended "Miners' Phthisis Act," which came into operation in August last, the continuance of the war tax, and the failure of the Union Government to introduce legislation for the relief of the mines from taxation by the Transvaal Provincial Council are discouraging factors.

Robinson Deep, Ltd.—The improved mining conditions consequent upon the completion of the "Chris" shaft and its connection with the mine workings have resulted in improved, and still improving, monthly profits, independently of the increased price at present obtainable for gold. A prosperous future for this mine is confidently anticipated.

Simmer Deep, Ltd.—The losses made during the months of August to November, 1918, inclusive, necessitated the provision of further funds in an attempt to save the Simmer

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Deep Mine from closing down. The first and second debenture-holders having agreed to the creation of £150,000 of prior lien debentures, the company guaranteed the issue of £100,000 thereof. Up to the present £40,000 has been advanced to this company, and it may be possible, under the existing gold market conditions, that mining operations will continue.

In addition to the mines specially mentioned the increased profits derivable from the sale of gold will beneficially affect the following mines under the company's supervision—viz.: Simmer and Jack Proprietary Mines, Ltd., Knights Deep, Ltd., Jupiter Gold Mining Co., Ltd., and Sub-Nigel, Ltd.

Southern Van Ryn Reef.—Owing to a difference of opinion between a considerable number of the shareholders of the Southern Van Ryn Reef, Ltd., and the company as to the method of working to be followed, the company has, for the time being, withdrawn from the board and from the engineering control of the mine.

Rhodesia.

Gold Fields Rhodesian Development Co., Ltd.—The net realised profit for the year to May 31, 1919, made by this company amounted to £147,530, and at the annual general meeting held on October 23, the declaration of a final dividend of 6d. per share was sanctioned, making, with the interim dividend of 6d. per share paid in May, 1919, 10 per cent. for the year.

Shamva Mines, Ltd.—For the year ended December 31, 1918, dividends amounting to 20 per cent. were paid by this company, and for the nine months ended September 30 last further distributions amounting to 15 per cent. have been made. The ore reserves, which at June 30, 1918, were estimated to be 2,016,000 tons, of an average grade of 4.3 dwts., remain practically unchanged at date, as regards both tonnage and value. Developments during the year give further promise of an extended life and the higher price obtainable for the gold justifies the expectation of increased dividends.

Falcon Mines, Ltd.—This company treated during the year to June 30, 1919, 150,961 tons of sulphide ore, estimated to yield 2,967 tons of fine copper, 33,597 ozs. of fine gold, 68,794 ozs. of fine silver. The falling off in the tonnage treated and output as compared with the previous year was due chiefly to the influenza outbreak in Southern Rhodesia in October, 1918, causing heavy losses among the white and native employees, which resulted in the entire shutdown of the plant for thirty-seven days. In addition, operations were affected by a shortage of coal deliveries to the mine on several occasions.

Rhodesian and General Asbestos Corporation, Ltd.—A dividend of 5 per cent. was paid in February of this year, making 10 per cent. for the period ended March, 1918. The company's financial year ended March, 1919, is expected to show continued progress and satisfactory profits, whilst the life of its mines is estimated to be considerably longer than was originally anticipated.

Farming.—Considerable attention is being directed to the possibilities of farming and cattle ranching. The latter industry, in particular, showed a marked advance during 1918, and the development of the export trade is confidently anticipated. The Gold Fields Rhodesian Development Co., Ltd., has sanctioned a certain expenditure towards stocking and gradually developing the Kenilworth-Longwe Estate.

America.

The principal investments of the Gold Fields American Development Co., Ltd., are dealt with in the report of the New York Committee.

American Trona Corporation.—The directors of the Gold Fields American Development Co., Ltd., announce that the war demands and war prices for American potash enabled the American Trona Corporation to market a mixed salt for the fertiliser trade at excellent profits during 1917 and 1918, and efforts were therefore largely confined to the production of such salts. The end of the War and consequent removal of restrictions on the importation of European potash have resulted in the reduction of the market price of potash salts to about one-third of the war price. The balance of profit in excess of the dividends paid on the preference shares up to March 1 last was expended on capital requirements, and the profit earned during the past six months is not sufficient to enable the preference dividend to be paid for that period. Mr. A. F. Keene, a well-known mining engineer, and Dr. John R. Teeple, an industrial chemical engineer of high repute, have recently examined the plant and property, and are now acting in an advisory capacity. Changes in the operating practice and organisation and various economies are being put into effect, which, it is anticipated, will make it possible for the corporation to compete successfully with European potash, American borax, and common salt, and recent advices report satisfactory sales of potash and borax.

Oroville Dredging Co., Ltd.—This company has continued to pay the quarterly dividend at the rate of 10 per cent. per annum. The American company—Oroville Dredging, Ltd.—having exhausted its dredgeable areas, is being wound up, but the lack of income from this source is more than compensated for by the dividends now received on its holding in Pato Mines (Colombia), Ltd., and in Nechi Mines (Colombia), Ltd., ordinary shares, from both of which companies' dredging operations good returns (restricted during the War) may be looked for. Later, an additional source of income may be expected from this company's holding of ordinary shares in the Colombian Corporation, Ltd., recently formed to work the Constancia Mines.

South American Gold and Platinum Co.—The interest in this company which was held by the Consolidated Gold Fields of South Africa, Ltd., has been acquired by the Gold Fields American Development Co., Ltd. No. 1 dredge has continued in operation, and besides affording valuable data for the future, produced during the year 1918 6,425 ozs. of platinum and 704 ozs. of gold, having a total value of approximately 586,000 dollars, while the production for the first eight months of 1919 was larger than during the same period of 1918. The construction of No. 2 dredge has been further delayed owing to war conditions, as well as to the unprecedented drought during the early months of 1919, whereby the river boats were prevented from reaching the camp with the dredge material. These difficulties, however, have now ceased to exist, and it is anticipated that this dredge will be in operation by the middle of January, 1920, when the output of platinum and gold should be very materially increased and, assuming the present price of platinum is maintained, the profits should be substantial. Designs for additional dredge equipment are being prepared.

West Africa.

Gold Coast Amalgamated Mines, Ltd.—This company distributed in May a dividend of 1s., plus a bonus of 6d. per share, making, with the interim dividend of 6d. per share paid in October, 1918, 10 per cent. for its financial year ended March 31, 1919. An interim dividend of 6d. per share on account of the current financial year has since been paid.

Ropp Tin, Ltd.—The output of concentrates continues to increase, the total for the year ended August last being 942 tons, compared with 810 tons for the previous twelve months. This company again distributed a dividend of 3s. per share.

(To be continued.)

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THE PROSPECTS OF THE EAST RAND MINING ESTATES.

A Start to be made with Opening Up Far East Properties—The New Largo Colliery.

THE report of the East Rand Mining Estates for the year to June 30 last states:—

Grootvlei Proprietary Mines, Ltd.—Since the close of the financial year arrangements have been concluded for raising the capital required for the development and equipment of this property. The capital of the company has been authorised to be increased to £1,500,000, and 250,000 of the new shares created have been offered to the shareholders of the Grootvlei Proprietary Mines at 21s. per share. The proportion of these shares for which the East Rand Mining Estates had the right (as shareholders in the Grootvlei Co.) to subscribe was offered direct to the shareholders, and the response was extremely satisfactory, and the issue has been successfully carried through. The whole issue was underwritten at a commission of 1s. per share, the underwriters also receiving options over a further 500,000 Grootvlei shares. The East Rand Mining Estates participated in this underwriting to the extent of 40 per cent. The consulting engineer of the company is now engaged in preparing the necessary plans and locating the position of the shafts, with a view to the starting of sinking operations at the earliest possible moment. The results of development operations carried out on adjoining properties during the past year have been so satisfactory that there is every reason to anticipate that Grootvlei will prove on development to contain reef of as high an average grade as that already opened up throughout the whole of this Far East Rand area. The position of the Mynpacht has been provisionally located, but after full consideration, and on the advice of the consulting engineer, it has been decided to defer making application to the Government for the definite location of this area and for a grant of the lease of adjoining claims, until a certain amount of development work has been carried out.

Largo Colliery Co., Ltd.—Active operations have been carried on during the past year in opening up and equipping this colliery. Two shafts have been sunk, a considerable amount of development work has been carried out, and deliveries of coal have commenced. All the necessary buildings have been erected and a railway siding from the main line to the colliery has been constructed. A very satisfactory contract has been concluded for the sale of the whole output of the colliery. In addition to the income to be derived from its shareholding in that company, the East Rand Mining Estates will also receive, under its agreement with the Largo Company, a royalty on all coal mined on the farm Palmietkuil in proportion to its interest in the farm.

Grootvlei.—The necessary steps are being taken to obtain the sanction of the provincial Administration for the establishment of a township on the south-western corner of this farm. In view of the great industrial activity now prevailing in this district due to the increasing development of new gold areas, the board is of opinion that there will be a large demand for stands in the Grootvlei Township, both for business and residential purposes, and that a considerable revenue will be derived by the company from the sale of building sites there. An area of 500 acres has been set aside on the western portion of the Grootvlei farm for the establishment of a tree plantation, and this area is now being ploughed and fenced, and planting will be started at the earliest favourable opportunity.

Palmietkuil and Vlakfontein.—Now that the Grootvlei Company has been successfully financed, the attention of the board is being directed to the development of these two properties. The farm Palmietkuil has been proved by boreholes to contain the Main Reef over a very large area, and Vlakfontein, although not yet bored upon, has been practically proved to contain the reef by the boring and development results obtained on neighbouring properties.

The revenue derived from farm rentals, interest, etc., during the year amounted to £6,062, which, after deduction of income tax, depreciation, and administration and other expenses in London and Johannesburg, and the cost of the 10,000 Largo Colliery shares granted to Mr. Isaac Lewis in accordance with the resolution passed at the last general meeting, gives a net profit of £1,021 for the year. This has increased the balance standing to the credit of profit and loss account to £9,226.

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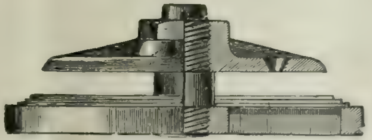

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DIVIDEND NO. 27.

NOTICE is Hereby Given that an Interim Dividend of Five per Cent. (i.e., Sixpence per Ten Shillings Share) has been declared by the Board of Directors for the half-year ending 31st December, 1919, payable to all Shareholders registered in the books of the Company on the 31st December, 1919.

The Transfer Register will be Closed from the 1st to the 7th January, 1920, both days inclusive.

Dividend Warrants will be posted to South African Shareholders on or about the 16th February, 1920.

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THE OUTLOOK FOR TANGANYIKA CONCESSIONS.

A Review of the Financial and Mining Position of the Great Katanga Corporation.

The accounts of the Tanganyika Concessions for 1918 show a net profit, after providing for administration expenses, debenture interest, etc., of £10,682, increasing a credit balance brought down to £214,898. Since the last meeting the Union Miniere du Haut Katanga has been able to hold a general meeting in Brussels, the first since the outbreak of War, when a dividend was declared up to December 31, 1918. In respect of this dividend £521,354 was received by the company, of which £352,800 was credited to profit and loss in the last accounts and the balance of £168,554 credited in this year's account.

The company's debentures are repayable with accrued interest and bonus of 5 per cent. six months after the date fixed by Royal Proclamation for the termination of the War under the Termination of the Present War (Definition) Act, 1918. The interest outstanding up to and including that due on January 1, 1920, makes a total of six coupons in all to be paid. In order to repay the above and other obligations, the directors have made arrangements for the issue of 1,200,000 new shares, 1,000,000 of which are to be offered to the shareholders at £3 per share. Any shares not taken by the shareholders will be offered to the debenture-holders. The 1,000,000 shares having been underwritten in consideration of an underwriting commission of 4⅛ per cent. upon the total cash underwritten, the company will be enabled to place itself in a sound financial position.

The directors have also taken this opportunity of settling with Mr. Robert Williams in respect of his rights in the profits. Under Mr. Williams' contract he is entitled during his life to an amount equal to 10 per cent. of the cash or other assets distributed among the shareholders by way of dividend from time to time declared, and in the event of his death while managing director of the company to a sum equal to 10 per cent. of the surplus assets over its liabilities. As a result of negotiations, Mr. Williams has agreed to become the managing director of the company for life, and in consideration of this, and in commutation of his share of profits and surplus assets, the directors have arranged to issue to him 200,000 shares, subject to approval. It should be mentioned that Mr. Williams has, to further the interest of the company, given away a considerable part of the benefits arising out of his agreement, but it is a condition of allotment that none of such shares are to be sold by him or his nominees for a period of two years from the date of allotment, and at least one-quarter are to be retained during his life.

Union Miniere du Haut Katanga.—Mr. Jean Jadot, the chairman at the general meeting held in Brussels in July last, described the difficulties which the Union Miniere Company has experienced during and since the War in connection with transport, fuel supplies, shortness of staff, epidemics, etc. The company were able to declare a dividend for the five years ended December 31, 1918, of 150f. per share—viz., 30 per cent. per annum. As Mr. Jadot pointed out, very heavy expenditure had been incurred during the War, and large sums had to be written off for depreciation and other charges, especially in view of the excessive prices paid for all plant and material during the War. The full smelting plant of seven furnaces, capable of producing up to 40,000 tons of copper per annum, although completed early in 1918, has not yet been able to run at full capacity, owing to the various difficulties above mentioned. In addition, a strike of white employees occurred in May last, which seriously affected the output, causing a complete stoppage of work for about a fortnight. The output for the ten months ended October 31 last was 18,339 tons, and the production for 1919 is expected to be a little over 22,000 tons, instead of over 30,000 tons, which was anticipated had better conditions prevailed. A large modern concentrating plant, which is now in course of erection and is expected to be ready for work by the end of next year, will materially assist in bringing the output up to 40,000 tons per annum. Mr. Jadot also stated that the operations at the Busanga mine, which were stopped on the outbreak of War, had been recommenced in 1918 as soon as the railway to Bukama was opened for traffic.

Benguella Railway.—In consequence of the abnormal conditions caused by the War, further construction on the railway has not been possible. The rails laid up to the present reach kilometre 520 and the earthworks have been completed to kilometre 620. Improvements have been carried on and storehouses and other necessary buildings erected. The revenue continues to show a considerable increase. The gross receipts for the last four years were: 1915, 535,066 escudos; 1916, 587,787 escudos; 1917, 631,697 escudos; 1918, 818,423 escudos. The directors of that company report that the receipts for 1918 amounted to 818,423 escudos, and the expenditure to 571,942 escudos, showing a surplus of receipts over expenditure of 246,481 escudos. They further point out that the increased receipts for 1918 are largely due to the agricultural and commercial development of the Benguella district and to the encouragement and facilities given by the management of the railway in consequence of the reduction in the tariff rates for low-priced products, regularity in the various services, facilities of transhipping in the port, and reduction to a minimum of the official formalities on the part of the working staff.

Rhodesia-Katanga Junction Railway and Mineral Co., Ltd.—The receipts for the year ended December 31 last, according to figures supplied by the Mashonaland Railway Company, amounted to £119,604, and the expenditure to £53,918, a balance of receipts over expenditure of £60,686. According to cables received the approximate excess of revenue over expenditure for the six months ended June last was £28,123.

Tanganyika Concessions owns about 70 per cent. of the share capital of the Rhodesia-Katanga Company. The railway has been leased to the Mashonaland Railway Company for a term of 25 years from October 1, 1913, at a minimum rental of £44,000 per annum, which sum is allocated to the payment of the debenture interest.

Kundelungu-Lualaba Exploitation Committee.—There is nothing further to add to the statements made in previous reports, all work having been suspended since the outbreak of War.

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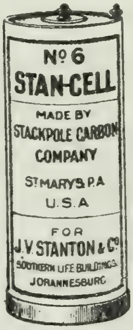

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A REVIEW OF THE SOUTH AFRICAN MINING AND ENGINEERING TRADE.—IV.

What Happened in the War Period—Possibilities of the Market for British Goods—American Competition.

THE following is the continuation of Mr. J. Wilson Goode's report on South African trade conditions:—

Locomotives.—The value of the importations of locomotives in 1913 was £60,148, of which £55,522 represented the value of the imports from the United Kingdom. During 1918 the value of the imports was £684, of which the United Kingdom contributed £353 and the United States of America £331.

Rolling Stock.—The importations in 1913 were valued at £59,155. The value of imports from the United Kingdom was £32,782, and from Germany £25,520. In 1918 the value was £66,363, of which goods to the value of £56,502 were imported from the United States of America, the remainder being supplied by the United Kingdom.

Tramway Material.—Before the War the imports of tramway material from the United Kingdom were a little in excess of the imports from the United States of America, and during the War the imports from the United Kingdom have been well maintained in face of exceptional difficulties.

Rails.—The total imports of tramway rails in 1913 were valued at £21,189, of which Germany contributed £14,257, the United States of America £4,296, and the United Kingdom £2,467. In 1915 the total imports decreased to a value of £7,358, and in 1918 the value of imports, which were all drawn from the United Kingdom, was £791.

Rolling Stock.—The imports in 1913 were valued at £28,403, the United Kingdom contributing £15,785, and the United States of America £11,794. In 1918 the total imports were valued at £6,558, of which the United Kingdom supplied £3,680, and the United States of America the remainder.

Telegraph and Telephone Materials.—The following figures only apply to the imports of telegraph and telephone material other than that used by the Department of Posts and Telegraphs of the Union of South Africa, and include the importations made on behalf of the Durban Corporation, who control the telephone system of that town, and the importations by the Eastern and South African Telegraph Company. The total value of the importations in 1913 was £17,907, of which the United Kingdom contributed £9,866, Sweden £2,765, France £1,711, and the United States of America £1,389. The importations in 1918 were valued at £5,997, of which Sweden contributed £2,500, the United Kingdom £2,238 and the United States of America £1,214. So far as Government requirements are concerned, the importations from countries other than the United Kingdom during the period of the War have been negligible, and are represented by copper wire to the value of £3,864 from Japan, and telephone instruments valued at £4,062 from the United States of America.

Agricultural Implements.—In 1913 the total importations of agricultural implements, other than dairy utensils, were valued at £359,644, of which the United Kingdom contributed £145,386, and America £165,499. The imports from Germany were valued at £28,687. During the War the importation of these articles has been considerably reduced, but the values have risen enormously. The value of the American supplies during 1918 was £249,096 out of a total of £419,282. The importations from Canada were valued at £104,755, which amount was nearly double the value of the imports from the United Kingdom. The progress which Canada has made points to the probability that Canadian manufacturers will retain a large share of the trade which they have obtained during the War. A quantity of plough shares is now being manufactured in the Union of South Africa, but large quantities are still being imported from the United States of America. In the manufacture of spades and shovels America has made great strides, and supplies of digging forks, hoes, scythes and sickles are now being imported chiefly from America and Canada. As in the case of Canada, competition from America is likely to be permanent.

Hardware.—The importation of metal goods from countries other than the United Kingdom has increased enormously owing to restrictions placed upon the exportation of such articles from the United Kingdom. The Union of South Africa now imports the under-mentioned goods entirely from the countries named, whereas before the War they were imported chiefly, and in some cases almost exclusively, from the United Kingdom: Steel mattocks, Canada and U.S.A.; steel pick axes, Canada and U.S.A.; bolts and nuts, washers, Canada and U.S.A.; iron shoe rivets, Canada; iron wood screws, Canada and U.S.A.; G.I. roofing screws, U.S.A.; lampware and lanterns, Canada, Japan, and U.S.A.; tools, carpenters' and farriers', U.S.A.; brick and plastering trowels, U.S.A.; pruning shears, U.S.A.; vices, U.S.A.; cutlery, pocket knives, scissors, razors, U.S.A. and Japan; tee hinges, butt hinges and similar metal goods, U.S.A.; copper rivets and washers, bifurcated rivets, U.S.A.; tacks, U.S.A.; vermin traps, U.S.A.; clyburn spanners, Japan; brass and copper wire, Japan and U.S.A.; padlocks, Japan and U.S.A.

Fencing Standards.—Before the War Belgium was by far the largest supplier of these articles. The value of the imports from that country in 1913 was no less than £154,593 out of a total of £203,125. Germany was the next largest supplier, with goods valued at £27,514, followed by the United Kingdom at £17,540. The total importations in 1918 only amounted to £785, of which the United Kingdom contributed £725. The supplies from the United States of America were always on a very small scale, mainly because America converts the metal into steel. No doubt the imports from the United Kingdom will revert to their pre-War level, but it is probable that Belgium will continue to be the chief source of supply. It may be mentioned that fencing standards, which were formerly made in Belgium, were handled and shipped to South Africa by German houses.

Fencing Wire.—During the War the position of the United States as the largest supplier of fencing wire has been maintained. Large quantities of fencing wire were imported from Germany before the War, and United Kingdom manufacturers should take every opportunity of endeavouring to capture a large portion of this trade. Before the War the imports from Canada were on a very small scale, but in 1918 the imports amounted to no less than 15,857 cwts., which is about half the quantity imported from the United States. Supplies from the United Kingdom during the same year were almost negligible. South African farmers have enjoyed several seasons of exceptional prosperity, and should now be in a position to improve their properties. A heavy demand for fencing wire is expected in the near future, but the question of price will have an important bearing upon future supplies. The American article, though difficult to import latterly, has been, and still is, regularly quoted by manufacturers, and large orders are at present on hand, both in the United States and Canada. During the War it has been the policy of the United Kingdom manufacturers to accept only open orders for delivery as and when possible, and buyers in South Africa have not been disposed to place orders on these conditions, even though the British article is generally preferred. The possibility of quotations from the United Kingdom being lower than those from America is by no means favourable and, therefore, it is probable that South African purchases will continue to be made from the United States of America and Canada for some time.

(To be continued.)

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PERSONAL.

Mr. D. Christopherson has returned to the Rand.

* * * *

Mr. F. R. Lynch, of the "C.M.S.," returned to the Rand this week.

* * * *

Mr. G. F. Wills, of Messrs. Edgar Allen & Co., has returned to the Rand.

* * * *

Sir Lionel Phillips, Bart., was warmly welcomed back to the Rand this week.

* * * *

Mr. Stuart Martin, Consulting Engineer to the Rand Mines/Central Mining Corporation, has returned to the Rand.

* * * *

Mr. Sydney H. Ball has been made a Chevalier of the Belgian Order of the Lion, in recognition of his work in developing the mining industry of the Belgian Congo.

* * * *

Sir Richard Redmayne, who is resigning the post of Chief Inspector of Mines, will devote himself entirely to the work of the Imperial Mineral Resources Bureau.

* * * *

We have to acknowledge the season's greetings from the Chairman of the Witwatersrand Commercial Exchange, and from Mr. Elsdon Dew and staff of the Electrical and Mechanical Department of the Central Mining Corporation.

* * * *

Mr. E. Farrar, Consulting Mechanical Engineer to the General Mining & Finance Corporation, is retiring at the end of the year, after 22½ years' service with the group. Mr. Farrar's duties are being taken over by Mr. H. W. Clayden, Consulting Electrical Engineer to the Corporation.

* * * *

Notice is given that His Excellency the Governor-General-in-Council has been pleased, in terms of Sub-section (1) of Section 2 of the Diamonds Cutting Act, 1919 (Act No. 38 of 1919), to appoint the following gentlemen as members of The Diamond Cutting Industry Board, viz.: Mr. A. C. Sutherland, M.A., M.C.E., A.M.I.C.E., Mine Surveyor, Department of Mines and Industries (Chairman); Mr. S. J. H. Brink, Chief Detective Inspector, Gold and Diamond Detective Department; Mr. M. Ferguson, Deputy-Commissioner of Inland Revenue, Johannesburg.

Latest Company Registrations.

The following is the list of Companies registered in November, 1919:

De Hill & Company, Ltd., 55, Commissioner Street, Johannesburg: capital, £1,000.

De Wildt Supply Stores, Ltd., 279, Church Street, Pretoria: capital, £2,100.

Central Bottle Store, Ltd., 382, Church Street, Pretoria; capital, £8,000.

Gebroeders Botha, Beperkt, Doornhoek No. 88, Distrikt Bloemhof, P.K., Schweizer Reneke; capital, £1,500.

The New D. & L. Syndicate, Ltd., 3, Corporation Buildings, Johannesburg; capital, £1,000.

The Sunray Products (S.A.), Ltd., 3 and 4, Norwich Union Buildings, Fox Street, Johannesburg: capital, £1,500

The Union Piano Saloons, Ltd., 27, Rissik Street, Johannesburg: capital, £3,330.

The Capital Hotels, Ltd., 220, Bank Street, Pretoria; capital, £5,000.

New Makganyene Diamond Mining Co., Ltd., 151, Stock Exchange Buildings, Johannesburg; capital, £75,000.

Ross Properties, Ltd., Bunny Buildings (opposite Hotel Cecil), Rothsay Street, Benoni; capital, £12,000.

Transvaal Produce Co., Ltd., 60, Pim Street, Newtown, Johannesburg; capital, £2,000.

The Union Bacon Co., Ltd., 15, Caithness Street, Ophirton, Johannesburg; capital, £5,000.

The Koster Milling Co., Ltd., Jameson Road, Koster, Transvaal: capital, £9,000.

Gaston Wilkinson, Ltd., 21, London House, Loveday Street, Johannesburg; capital, £60,000.

The Southern Development and Trading Co., Ltd., 4 and 5, Bussey's Buildings, Commissioner Street, Johannesburg; capital, £500.

Benghiat, Ltd., 4, 4a, 5, and 5a, Burchmore's Buildings, Fox Street Johannesburg; capital, £1,600

Mendelsohn, Ltd., 309, Pretorius Street, Pretoria; capital, £1,000

Vaalbank Coal and Land Co., Ltd., 125/9, Exploration Buildings, Commissioner Street, Johannesburg; capital, £8,000.

A. I. Blankfield & Co., Ltd., 252, Main Street, Johannesburg; capital, £2,000.

Central Springs Properties, Ltd., 20/22, London House, Loveday Street, Johannesburg; capital, £1,000.

Transvaal Silver and Base Metals, Ltd., First Floor, General Mining Buildings, Main Street, Johannesburg; capital, £70,000.

Sydney Clow & Co., Ltd., 12, Simmonds Street, Johannesburg; capital, £300.

V.B. Syndicate, Ltd., 1 and 2, Reserve Investment Buildings, Church Square, Pretoria; capital, £1,500.

Breet Street Estate, Ltd., 4, Transvaal Goldfields Buildings, Fraser Street, Johannesburg; capital, £500.

Barker, Sons & Co., Ltd., 3, Ulster Buildings, 38, Eloff Street, Johannesburg; capital, £2,000.

McNamara Shot Drills, Ltd., Farrar Buildings, Simmonds Street, Johannesburg; capital, £22,000.

Rand Co-operative Stores, Ltd., 27 and 30, Beresford Buildings, corner Main and Simmonds Streets, Johannesburg; capital, £800.

Anderson & Jacobson Brothers, Ltd., Howard Buildings, 23, Loveday Street, Johannesburg; capital, £6,000.

FOREIGN COMPANIES.

Premier Mica Mines of South Africa, Ltd., care of J. H. Humphreys, 17, Mercantile Buildings, Johannesburg; capital, £10,000.

Spencer Bay Diamond Mining Co., Ltd., care of J. S. Richardson, 150/2, Stock Exchange Buildings, Johannesburg; capital, £25,000.

Vickers, South Africa, Ltd., care of A. Aiken, and/or J. G. Carter, and/or T. S. Adams, National Bank Buildings, Simmonds Street, Johannesburg; capital, £10,000.

SPECIAL AND EXTRAORDINARY RESOLUTIONS.

Asbestocement Manufacturing Co., Ltd., Johannesburg; conversion into Public Company.

Transvaal Citrus Farms, Ltd., Johannesburg; conversion into Public Company.

Torf Bros. & Zinn, Ltd., Johannesburg; change of name.

A. Sonnenberg & Co., Ltd., Johannesburg; alteration of Articles.

Northern House, Ltd., Pretoria; destruction of Books.

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DECLARATION OF DIVIDEND No. 10.

NOTICE IS HEREBY GIVEN that Dividend No. 10, in the form of two shares in the Company for every 25 shares held has been declared, payable to shareholders registered at the close of business on Wednesday, 31st December, 1919, to holders of Coupons No. 10 attached to Share Warrants to Bearer, and to persons to whom new shares have to be issued against Option Certificates surrendered on or before the 15th instant.

The shares to be thus distributed will be provided out of those purchased from the Custodian at £2 per share, and are calculated at that price. Fractions of shares accruing to shareholders in respect of this dividend will be realised for the benefit of the shareholders concerned, but, as the number of shares available will be insufficient to provide for all fractional parts accruing, those fractions for which no shares are available will be paid at the same rate out of the cash profits of the Company.

The shares distributed will rank for dividend as from the 1st January, 1920.

Share Certificates and cheques in payment of fractions accrued (if any) will be posted to shareholders as early as circumstances permit, after receipt of final returns from the London Office.

The Transfer Books and Register of Members will be closed from the 1st to the 7th January, 1920, both days inclusive.

By Order of the Board,
UNION CORPORATION, LIMITED,
Secretaries,
per R. W. E. HAWTHORN

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THE WEEK IN THE SHAREMARKET.

Irregular—Strikes and Holidays Restrict Business—Notable Improvements in Van Ryn Deeps and City Deeps.

THE Simmer Deep trouble and the holiday season effectually counteracted the good dividend declarations and the gold premium this week. Business fell away towards Christmas Eve; and the Exchange will not re-open till Monday, December 29. Van Ryn Deeps and City Deeps were the only important gold shares to improve; and among diamonds the syndicates were all less active. Frank Smiths have strengthened on news of a favourable report on the mine and its equipment, coupled with the knowledge that the stones will fetch much more than anticipated. Tins have been firmer, and for Zaaiplaats there was some demand. Generally, however, dealers were not anxious to do business in view of the prevailing labour uncertainty, and preferred to wait and see what might happen after the Christmas holidays.

	Fri. 19th.	Sat. 20th.	Mon. 22nd.	Tues. 23rd.
African and European	17 0*		—	—
African Farms	16 0	15 6	15 6*	15 6*
Anglo-American Corporations	54 0*	54 3	54 6*	54 0*
Apex Mines	7 9	7 6*	7 6*	7 6*
Bantjes Consolidated	5 0	4 9	5 3†	4 3*
Brakpan Mines	70 0		—	70 0
Breyten Collieries	8 0*	—		—
Brick and Potteries	—	—	—	5 0*
British South Africa	4 9*		—	—
Bushveld Tins	2 4*	2 3	2 5†	2 5*
Cassel Coals	29 0*	30 0*	—	30 0*
Cinderella Cons.	—	7 6†	7 6†	6 9*
City and Suburbans	7 9*	8 0	8 3	7 9*
City Deeps	66 0*	66 0	—	67 0†
Clydesdale Collieries	29 6	28 6*	29 6	29 6
Con. Investments	30 0*	30 0*	30 0*	30 0*
Con. Langlaagtes	—	24 3†	23 0*	24 0†
Con. Main Reefs	14 0	14 3	14 6	13 9*
Con. Mines Selection	30 0*	31 0*	32 6*	33 0
Coronation Collieries	—	—	71 0†	71 0†
Coronation Freeholds	2 5	2 6	2 5*	2 5*
Coronation Syndicates	20 0	19 6	18 6*	16 0*
Crown Diamonds	12 6	12 6	12 0	12 0*
Crown Mines	72 0	71 0	72 6†	71 6*
Daggafontein Mines	19 3	18 6a	18 6*	18 6*
Do. Options	—	1 6*	1 6	1 9
East Rand Coals	2 7	2 7*	2 7*	2 6*
East Rand Deeps	1 4	1 3*	1 3*	1 3*
East Rand Proprietary	11 11	11 0	11 0*	11 3
East Rand Debentures	—	£70*	£70*	£70*
Eastern Golds	1 3*	1 3*	—	—
Frank Smith Diamonds	10 7	10 9	10 8	10 8
Geduld Proprietary	59 6	58 6*	59 0†	59 6†
Glencoe Collieries	5 3*	—	5 9*	5 9*
Glynn's Lydenburg	16 0*	16 0*	17 6†	15 0*
Government Areas	100 0	99 0*	100 6	101 0
Hume Pipes	22 0*	22 0*	22 0*	22 0*
Jupiters	6 9	6 0*	6 9*	6 2
Klerksdorp Proprietary	2 0*	2 0*	2 0*	2 3*
Knight Centrals	7 2*	7 3	7 5	7 0*
Knights Deeps	10 3*	10 3	—	—
Lace Proprietary	20 0†	20 0†	20 0†	18 6
Leeuwpoort Tins	29 6	29 3	29 6	29 3
Luipaardsvlei Estates	—	7 3†	—	—
Lydenburg Farms	8 6*	8 6*	8 6*	8 8
Middelvlei Estates	2 5	2 3*	2 4*	2 3*
Modder B.'s	185 0	181 0*	183 0	181 6*
Modder Deeps	54 0	53 6*	53 6	54 6
Modder Easts	30 0	29 3	30 0	30 3
Do. Options (3 years)	11 6†	10 6	10 6*	10 0†
Do. Options (4 years)	13 3	12 9	12 6	11 9
General Minings	10 0*	—	—	—
National Banks	—	297 6†	297 6†	297 6†
Natal Navigation Collieries	—	30 0†	30 0†	30 0†
New Boksburgs	—	2 0*	2 0*	2 0*
New Eland Diamonds	—	83 0*	83 6*	82 6*
New Era Consolidateds	12 6*	12 3*	12 0†	12 9†
New States	31 3†	30 6	30 0	31 0*
New Heriots	8 6*	8 6*	9 0	9 6*
New Kleinfonteins	14 0	—	13 9†	13 0*
New Modderfonteins	—	£34a	£33¼	£33¼
New Primrose	3 6*		—	—
New Unifieds	5 9*	6 0*	6 3	6 6†
Nourse Mines	—	14 0*	14 0	14 0*
Pretoria Cements	102 6	102 †	100 0	102 0a
Princess Estates	3 2	3 0*	3 0*	3 0

	Fri. 19th.	Sat. 20th.	Mon. 22nd.	Tues. 23rd.
Rand Collieries	3 9*		1 0*	1 0*
Rand Nucleus			2 1*	2 0*
Rand Selection Corporations	100 0	—	95 0*	100 0
Randfontein Deeps	5 6*	6 3†	6 3†	5 6*
Randfontein Estates	25 0*	—	24 6*	24 9*
Rouxville Diamonds	26 3*	26 6	25 6	24 9
Roberts Victors	17 6	16 0*	16 0	16 6
Rooibergs	8 3*	8 3*	8 3*	8 6
Roodepoort Uniteds	—	4 9*	5 0*	5 0*
Ryan Nigels	4 2*	4 6†	4 2*	4 2*
Standard Buildings		17 6†		17 6†
Shebas			2 6	2 6
Simmer and Jacks	7 6*		7 6*	7 6*
Simmer Deeps	3 0*		3 0*	3 0
South African Breweries	42 6*	47 6*	50 0†	
South African Alkali	25 0	25 0a	25 0*	25 6
South African Lands	6 6*	6 7*	—	6 6*
South Van Ryns	9 0	8 9	8 9*	8 9
Springs Mines	55 3	54 6	54 3	54 9
Sub-Nigels	20 3*	20 0*	20 0*	20 3*
Swaziland Tins		—	17 6†	—
Transvaal Lands	30 0†	30 0†	—	30 0†
Transvaal G.M. Estates	15 0*	16 6		
Tweefontein Collieries		25 0*	25 0*	25 0*
Union 5 per cent. Tax	£102*	£102*	£102*	£102
Union 4½ per cent.	£102¼*	£102*	£102¼*	£102¼*
Union 5 per cent.	£103¾*	£103½	£103¾	£103½*
Van Ryn Deeps	98 9	102 0	107 0	105 0
Van Ryn Estates	—	21 0†	—	—
Victory Monarchs	40 0*	40 0*	40 0	—
Village Deeps	16 0*	17 0†	16 3*	16 0*
Village Main Reefs	8 6†	8 6†	8 6†	8 6†
Van Dyks	2 10*	3 0*	3 0*	3 0*
West Springs Options	—	7 3	7 6*	7 9
West Springs	23 6*	23 6	23 3	23 0
West Rand Consolidateds	—	6 3*	6 9*	7 9
Western Rand Estates	9 0	9 6†	9 0†	8 6*
Witwatersrands	19 6†	19 6	—	
Witwatersrand Deeps	—	10 0†	10 0†	10 0†
Wolhuters	5 3*	5 6*	5 3	5 9†
Zaaiplaats Tins	8 9	10 0a	9 3*	11 6

*Buyers. †Sellers. AOdd lots. BEx London.

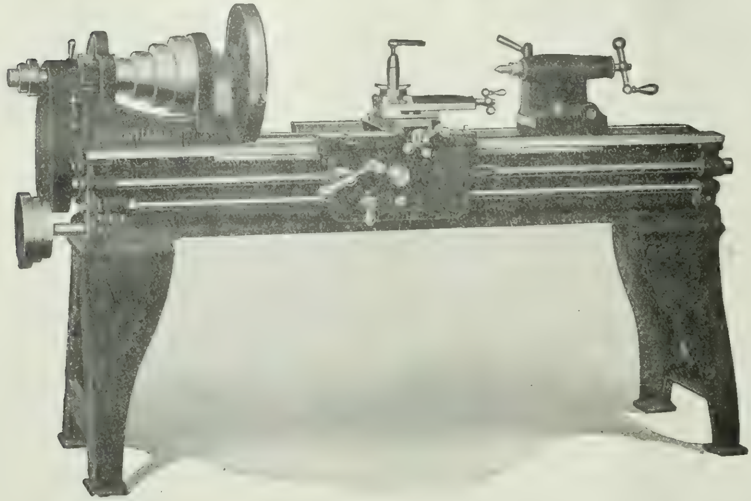
The Gold Problem.

We understand that the Government is very seriously considering the suggestion made by the President of the Chamber of Mines on Monday that an inconvertible Government issue of gold warrants should be issued to prevent the drain of gold currency. Gresham's Law says that "bad money drives out good": and something will have to be done to counteract the inevitable loss of gold if and when the Union mints its own gold and allows its free export. Under such circumstances, Sir Evelyn Wallers said, "no measures conceivable would prevent our sovereigns disappearing from circulation, and to maintain our gold currency was equivalent to pouring our sovereigns into a sink at the present time. They would disappear in every direction."

Packing Boxes Without Nails.

Arrangements are being made in Great Britain for increasing the output of a novel and ingenious form of packing crate or box. It requires no nails, no screws, no hinges, no wires; it is collapsible and when put together is capable of holding any kind of merchandise. Rigidity is obtained by a system of interlocking parts. A special method of sealing the cases has been adopted to render the work of the pilferer more difficult. With the ordinary nailed-up box it is an easy job for the railway thief to apply a jemmy or a nail lifter and restore the original outward appearance of the package after he has extracted the contents. With this new crate it is impossible to extract any goods without leaving obvious signs that the package has been tampered with. Another advantage in these days of congested transport is that "returned empties" take only one fifth of the space occupied by the non-collapsible box.

"SEBASTIAN" LATHES



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TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Premiums on Gold, Silver, Diamonds and Tin—Gold Position a Lasting One—Timber and Building Materials—Iron, Steel and Machinery—Electrical Goods—Commercial Exchange.

The end of the year finds us in the midst of a building boom, and men are difficult to get, more particularly bricklayers, who are at a premium, also skilled artisans in the building and subsidiary vocations. Not only are contractors held up for men, but timber and bricks are scarcer and dearer. The gold premium of 28 per cent. has created much confidence as regards the prospects of the lower-grade mines, which is really a bit of luck to this particular part of the universe. The Chamber of Mines rose to the occasion and met the demands of the employees on account of the higher cost of living. Perhaps for the first time they did it with open hands, because it was the first time they could pass on the extra cost of mining and taxes to the consumer. It is to be hoped that the Simmer Deep "one man" labour strike will be arranged before this issue appears. The President of the Chamber of Mines on Monday said that the Board of Reference principle was an admirable one—may the Simmer Deep benefit from its benign influences. The trouble at the Capetown docks is being taken in hand by the Government, and although the wish is father to the thought, we are hoping for the best both for the strikers and the man with a family who has to pay 1s. per 2 lb. loaf in Johannesburg. The cost of living is certainly the whole trouble. The feeling on the Commercial Exchange and amongst merchants is more optimistic, because the mines have made a good hole in their reserve stores, therefore the merchants hope to come into some of their own again after the commencement of the New Year. However, the merchants' stocks are not too plentiful, on account of the difficulty in negotiating the American exchange of 4s. 7d. in the sovereign, that is checking and almost stopping business with them excepting in the essentials, some of which can only be had in America. The premiums on gold, silver, diamonds and tin are the reasons for such optimism prevailing throughout commercial circles, all of which seem thoroughly justified.

THE PREMIUM ON GOLD.

The latest cable advices show that the sales of gold in the open market in London show a premium of approximately 28 per cent. The President of the Chamber of Mines said that the effect of this added value on all gold mines, and particularly on the low-grade section, was to have kept them going during the last six months, and their closing down would have been imminent, if indeed such an event had not already happened in some cases. Therefore without exaggeration it can be said that the premium on gold has saved the situation for the time being. So far so good, but the question now is, what prospects there are in keeping the premium up, because as the premium pendulum swings so the prosperity of the low-grade mines goes. The President in a carefully prepared speech said that it is hopeless to maintain a gold currency in South Africa in view of the world conditions and in the insatiable demand for gold. No measures conceivable will prevent our sovereigns disappearing from circulation, and to maintain our gold currency is equivalent to pouring our sovereigns into a sink, at the present time, as they will disappear in every direction. This strong and vigorous language is an indication that the gold premium will and must last until the world's exchanges become more normal and until the huge quantities of paper money in Britain and Europe are supported by something like a reasonable gold backing. A country's paper money is only good in the country printing and issuing it, and therefore gold and gold only is the international medium of exchange. In addition to gold being wanted to back up legitimate paper money, it is only natural that individual hoardings, especially in such places as India, Russia and even in Africa will obtain. Hence another important reason why the gold premium will remain with us for several years. Merchants here can therefore take heart and indent and act generally upon that basis. In support of that the President stated that a very extraordinary indication of the gold position has come from America. He had been informed that notwithstanding the extraordinarily favourable balance in trade to its credit, yet it is constantly losing gold by export and has just issued warnings in this connection. A remedy suggested for South Africa to retain its floating gold coins is the issue of Treasury gold certificates, fully backed by gold, but temporarily inconvertible. When responsible men recommend that something like this should be done, it is testimony to their belief in the permanence of the gold premium, which is the object of these notes to illustrate and so give our merchants and financial men pointers for their guidance or at least their consideration.

TIMBER AND BUILDING MATERIALS.

In some yards the position of timber is easier as regards supplies, as fair quantities have recently arrived from the coast. Values are quite firm in the high level rates, with the exception of scantlings, which are 2d. per ft. cheaper than deals, but deals are especially high because of their scarcity, and it would take a long time to catch up old orders. Current prices are: Deals, 1s. 10d. to 2s.; scantling, 1s. 8d. to 1s. 10d.; floorings, 10d.; ceilings, 6½d. Some yards are short of 6 in. flooring boards, but there are plenty of 4½ in. Roofing iron is also easier, as more consignments have also arrived. The quotations are: 1s. 6d. for 10 ft., 1s. 7d. for 12 ft. of 24 gauge. A timber merchant says that prices are not likely to go lower, as there is shortage of stocks in the Baltic, and America is out of the question through the high exchange. His opinion is that through the extraordinary demand in Johannesburg prices may increase to another 1d. per ft. after the turn of the year, when as many contracts will be taken as the supply of workmen and material will admit of. One contractor, who has

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WRIGHT'S ROPES

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undertaken to build twelve villas, has practically closed down until after the New Year, through the shortage of bricks available for new work. As regards hardwood, stocks on hand in Johannesburg are only fair, and the prospects of getting more, especially from America, are poor. Japanese oak 20s. to 24s., and Burmah teak 27s. to 30s. a cube; second-hand quality about 2s. 6d. less. Poplar, 1s. 6d. to 1s. 9d.; clear pine, 1s. 6d. to 1s. 9d. per ft.; beaver board, 5d.; and three-ply, 8d. to 9d. per sq. ft. Painters continue busy, but ingredients for paint are dearer. Turps, 110s. for 2-4's, 120s. for 10-1's; linseed oil, 105s. raw, and 110s. boiled; genuine Canadian white lead, £82 10s. per ton landed here; red lead, £75 per ton.

Iron, Steel and Machinery.

The demand for iron and steel bars is good, much better than is usual at this time of the year. The greater portion goes to Johannesburg and Reef, but there is nothing special for the engineering shops and foundries. In addition to the immediate home trade, according to the copies of the invoices, consignments of bar iron, brass sheets and rods have been sent this week to Middelburg, Windhuk, Durban, Krugersdorp, Pretoria, Natal, Benoni, Germiston, East London and Standerton. There is a shortage of steel plates, and the demand seems much bigger, as it is said that only about three firms have anything like fair and assorted stocks. The price for 1-16 in. is up to 70s.; ⅛ in., 60s. to 55s.; ¼ in., 50s. to 45s.; and other thicknesses, 45s. to 42s. 6d. Tool steel, high speed, 5s. 6d.; low speed, 1s.; drill steel, 7½d. per lb.; imported mild steel, 37s. 6d. per 100 lbs.; brass rods and plates, 2s. 6d. per lb.; wheelbarrows, 55s. each; shovels, 65s. per dozen; ½ in. and ¾ in. galvanised piping is about 25 per cent. up. There is a great scarcity of second-hand machinery, particularly loco. and engine boilers, also all kinds of shop lathes and machines in connection with the turning of steel and iron; in fact, there have been no mines depleted of late, therefore everything in the shape of machinery is scarce, and no one can see where the next lot is coming from. There are several derelict mines not yet completely sold out which are still open to sell, but the controllers have evidently learnt a lesson during the War from the second-hand dealers, who purchased job lots or the whole equipment and re-sold them at per foot or per 100 lbs. The few mines having anything left have practically adopted this plan; therefore when one wants a load of second-hand piping it is measured out at so much per foot, and machinery spares are sold at per lb. or for each, as the case may be.

Electrical Goods.

Dealers in the electrical material trade are and have been rather busy during the past fortnight, and the position in respect of materials, owing to recent arrivals and consignments advised, is easier than it has been for some time past. It is curious to have to report that in regard to tubing, which until quite recently has been very scarce indeed at almost prohibitive prices, a dealer who had himself experienced an acute shortage in that commodity informed us that he was very agreeably surprised lately to get an offer of tubing from a Capetown firm at the cheapest price made since the outbreak of the War. Business, both town and country, is brisk, and the approaching holiday season seems to have advantageously affected it.

Commercial Exchange.

One can hardly remember a time since the Commercial Exchange was opened that such a "do nothing" holiday feeling prevailed. One broker says that it is also a long while since he experienced such a dull December from the mining groups. A buyer from the groups says he has reason to think that after the turn of the year business will be decidedly better. The Belgian Congo at the moment is the best customer, more particularly in all kinds of power machinery, in fact these are the people who have cleared most of our best boilers and engines lately.

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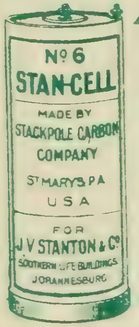

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AFTER-WAR PROBLEMS AND COAL

SOUTH AFRICA'S OPPORTUNITY

It is not possible to summarise in two or three pages the coal problems of a war-shocked world: especially as it more and more appears that coal is the head corner stone of modern industry, and therefore, of civilisation. Nearly every day the cables flash news of coal. We have been kept apprehensive of the effect on "law and order" of coal shortages in Britain and America mainly; but a little deeper examination reveals industrial dislocations of quite amazing extent throughout the world. The old long-established channels of trade, worn by the busy commerce of a century of peace, have suddenly gone dry, and with their drying there are simultaneous rumours of riot and revolution following on distress and sudden shortages of the necessaries of life. The leaders of the world are at their wits' end to restore the old ways and values, and find themselves compelled to employ the strangest means and remedies in order that industry and commerce may recover from the shocks of a war that has seemingly robbed great numbers of otherwise sane men of the ordinary attributes of reason.

Gigantic Problems.

Speaking a few months ago in the House of Commons, Mr. Lloyd George, the Premier, whom we may accept as an interpreter of current events, said: "The House will remember that at the beginning of the year we were threatened with a great industrial upheaval in the mines, and if that had taken place it would have seriously retarded the re-establishment of industry. . . . . . There are two separate classes of subjects: One is an immediate one, the question of the hours of labour; the others are great questions of policy, such as the condition of the industry, the conditions and methods of working, the social conditions under which miners live, the nationalisation of minerals, State ownership and management of mines, and the co-operation of workers in the control of the industry; these are gigantic questions of policy."

So far very little has been done in Britain to settle these "gigantic" questions. The Commission presided over by Mr. Justice Sankey advised in effect the nationalisation of the coal mines of Britain. On this subject Mr. Lloyd George, in the same speech from which we have quoted, said that the Government's recommendation would be to reorganise the coal industry so as to reduce to a minimum the expenses of management and the working charges. To do this the country would be divided into areas, within which the amalgamation of the various mines could be undertaken and carried out within a limited period. The worker and the consumer would be protected. The scheme of amalgamation must in each case conform to the conditions which would be laid down by the Government. The minerals would be purchased by the State, and a fund would be raised to improve working conditions, but the State would not purchase the business of the mines. The miners would be represented on the amalgamated companies.

Long-drawn-out War.

It is not necessary to say that these shadowings of new coal policies have not yet become concrete. The workers want nationalisation, and a great many other people want more liberty of action. The strife between these sections will continue for some time yet. But the mere mention of the intentions of the British Government is enough to reveal the vast distance travelled by this basic industry of coal mining during the last five years. No one can say how these questions and difficulties will be settled in Europe: all that one can be sure of is that years must pass before there can be any certainty and ordered development in the problems created by the human reaction evolved by war from so dull and prosaic a business as the mining of coal.

Few people realise how complex these reactions are, and how widespread. Not long ago a meeting of the Supreme Economic Council was held in London, and a report was read from Mr. Hoover, the head of the American organisation for the supply of food and other necessities to Europe. He stated that Europe's coal production was 35 per cent. below normal. He said that "England's annual coal production had fallen from 292,000,000 tons in 1913 to 183,000,000, and that Germany's decline was even greater. Europe," he added, "at the present rate will produce 443,000,000 tons next year, while the amount needed is estimated at 614,369,000 tons."

Human Factors.

An important fact in this European shortage is that very little help can be got from America. Mr. Hoover said then that the European coal situation "cannot be relieved materially by the slight help which the United States can give." And since that expression of informal opinion the position has worsened very much in the United States. "Labour" there suddenly presented in October a series of demands which included a six hours' day underground, a five day week with time and a half for overtime and double time work for Sundays and holidays. In addition an all-round increase of 60 per cent. in all mine wages was demanded.

The difficulties arising from this sudden irruption of the peace time American miner into the coal war problems of Europe have not been settled at the moment of writing, though various provisional settlements have been reported. But whatever the outcome of this dispute the net result must be to increase greatly the price of American coal and so prevent the resumption of pre-War exports and prices. The prices of American coal will move upward as the British prices have done already as a result of the Sankey award, which reduced the British hours from 8 to 7 (practically

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bank to bank) and put up the scale of wages. Both Britain and America therefore are for the present seriously handicapped in recovering their former export coal trade.

The German Penalty.

And Germany and France are in even worse case. Germany has been compelled under the Peace Treaty to transfer the coal mines of the Saar Valley to France, and the immediate probable result will be a lessened output from those mines. In 1913 the coal output from those mines was over 13 million tons, or about 7 per cent. of Germany's annual output. Most of that coal went to Germany. A great part of the output was coked for the smelting requirements of the great iron mines of the valley. But it will take some years before the violent dislocation of mining business due to the War and Peace Terms can be remedied.

In the meantime Germany is burdened in addition with the supply of more than 43 million tons to the Allies. In 1913 her coal output was 190,000,000 tons, and of lignite, which is largely used as a domestic fuel, 87,000,000 tons. Without going into details it may be said that Germany has her own labour troubles with miners, a depreciated currency, and demands for higher wages, and it can be predicted with assurance that years must pass before she can recover her old productive position.

In France there are even more serious shortages in prospect, for assuming that she gets some coal from Germany, her own mines are in a parlous state. It is stated, for example, that a pumping plant of 40,000 horse power is needed for a couple of coal mines in the devastated area, and that pumping must continue for two years before these two mines can resume working. Not much immediate help can, therefore, be expected from France, who is also burdened with the obligation to assist Belgian industries.

The Mines Remain.

In the above paragraphs the human aspects of the new problems of coal mining are hinted at. Coal will be in short supply, and costs and conditions will be adverse for a long time to come owing mainly to the human factors involved in mining coal and in transporting it having gone awry. The mines themselves are as productive as ever, except in Belgium and Northern France: the trouble is not one of deficient supply. In America alone the vast beds of coal are accessible to supply the world. A recent estimate of the quantity of coal in the workable coal seams of the States computes that within 3,000 feet of the surface there are three and a half million million tons of coal, and in Britain and Germany the reserves, though far smaller than the gigantic American figure, are yet ample for the needs of industry for centuries. In time perhaps the limiting conditions that have adversely affected the coal production of the civilised world may be overcome, and coal may again travel in its old channels of supply to the working and travelling peoples of the world. But that time is not yet. The War has raised barriers between the peoples of the world. Movement has become more expensive. Trade, the exchange of commodities and the movement of people to and fro' has become more difficult. And these conditions will last for a long time. Vast as the coal supplies of Europe and North America are, they are no longer the mobile and facile attendants on commerce and industry of pre-War days. The old servitors are working under great frictions and imperfections, and the outside world that once relied on them will now turn to new and nearer servants.

SOUTH AFRICA AND HER OPPORTUNTY.

This breaking up of the old establishments is of particular interest to South Africa, who believes that a period of opportunity is now before her. Here there is coal. How far can it be used to supply those nearer points of consumption that lie about the Indian Ocean and even South America?

It is to give some of the data necessary for the solution of this question that this coal number of The South African Mining Journal is written. There are not a few illusions about this question. Men in authority talk vaguely of great coalfields containing coal of super-quality that need only markets to bring new wealth to South Africa. Is the picture a true outline of the facts? Is South Africa rich in great coalfields, and can she reap new mining harvests when gold finds its market level and drops in value, shall we say, to 70s. an ounce?

And first it is necessary to remove a wide-spread misapprehension as to the non-existence of serious competitors in what may be termed the Indian Ocean and West Pacific Ocean markets. China must be reckoned with. Vast as her population is China's coalfields are a worthy auxiliary of her human strength. And her iron fields are also on the big scale. It is estimated that there is four times as much anthracitic coal in China as in the rest of the world put together. And the end of China's coal resources has not yet been visualised. Japan and America are not quarrelling for nothing about the terms of the Peace Treaty. Under Japanese guidance, and still quicker under an American impulse, the coalfields of China can supply both East and West from Suez to Peru. Of course, shipping is wanted; but shipping will be rapidly supplied, and then China's labour supply, paid in cheap money, will begin to show what can be done by a people that has learned to work.

Japan and Indian Competition.

But China is not alone in her threat—Japan has coalfields. In 1890 the output was 2½ million tons; in 1917 it was 27 million tons. But of this output Japan used ten million tons in her factories and six million tons in her steamships. She has no coal for export to speak of, though relatively she dwarfs the poor South African export of coal. In 1917 she exported four million tons to the East Indies, including Singapore, and to Eastern Asian ports.

The War gave Japan a coal monopoly in Eastern ports, and as a consequence the price rose from 20s. per ton before the War to 66s. and more. But this stimulus did not greatly increase the Japanese output, which was 22 million tons in 1914 and only 28 million tons in 1918. Having cheap labour, Japan could increase her coal supply to any extent if the coal beds permitted it; but her coal resources, if we may accept Marquis Okuma's estimate, are not too great, and she will soon use her whole output for her internal development.

Then there is India. In this country there is a general impression that India has very little coal. But this is not so. The Indian Association of Colliery Managers has nearly 200 members, a figure which is some guide to the number of mines opened. There were 176,000 persons employed in Indian coal mines in 1918, a number almost equal to the number of labourers employed in Rand Mines. And curiously enough labour is scarce in India, and some Chinese were imported to make up the shortfall.

These miners produced 19,847,000 tons of coal in 1918, a figure far in excess of South Africa's. The Indian output for last year increased over that of 1917 by two and a half million tons. The coke industry alone took 707,000 tons.

These are relatively large figures, and the Chief Inspector of Mines says that "the whole question of the output of Indian coal is one of labour. Given a sufficient supply, the output from the existing workings could be increased 50 per cent."

Other Competitors

Another competitor for the coaling trade of the East is Australia. New Zealand is also in the picture. In New South Wales the Newcastle field is conveniently situated for an export trade over the Indian and part of the Pacific oceans. The coal is of good quality and is raised in large quantities. In Queensland, farther to the north, there are wide coal fields not much developed as yet but capable of supplying all the shipping trade of the Eastern routes.

But labour controls the output of Australian coal and regulates her competitive power as against the values of South African coal. Cheaper labour here will enable South Africa to keep a place in the ocean trade against the highly paid white labour communities of Australia and New

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Zealand. There is also the problem of transport, which is a deciding factor in the markets of such a bulky article as coal.

There are other small coal fields in the East, but none of them have become serious competitors to the Japanese, Indian and Australian coal producers. At the same time it is possible that further exploration may uncover payable coal beds in Siam, the Malay States, or in some of the larger islands. In oil, of course, the petroleum fields of the East Indies take an important place, and the extending use of oil in ships must be kept in mind as an element in the business of supplying fuel to the countries bordering on the Indian Ocean.

The Old Coal Merchants.

Before the War English and American coal was the leading fuel supplied to South American and Asian ports. Welsh coal could be sent out to such countries as the Argentine or to the eastern Mediterranean at very low rates, as it was in reality a fill-up cargo for the grain, wool and other ships carrying raw material to England.

The conditions which made it possible to send coal cheaply to remote coaling bases before the War will remain in action for a long time to come. As ships increase in numbers and freights fall the charges for the transport of raw material to manufacturing countries will make it possible to recover much of the old coal export trade of England and North America.

At present, however, the two giants are sorely crippled, and it is improbable that the old export—and monopoly conditions that gave England and the States the export—coal trade of the world can ever be restored. America, seeing that England had reduced her coal output by 50 million tons in 1918 when compared with 1913, announced her intention of capturing the old coaling bases of the British Empire and of the world. But the shortage of coal has extended, as all are aware, to the States also, and the strikes and a lower individual output have put them temporarily agley. The American coal business was decreasing months ago and the output seems likely to show lower figures for a long time to come. The output per week in 1917 was 10,611,000 tons. In 1918 it was 11,216,000 tons per week. But for the period January to July, 1919, it was only 8,349,000 tons per week. This very serious shortage has affected the internal business of America very much, and till the world outlook is clearer and more settled we must suppose that the States will be like the rest of the world, much handicapped in recovering their commanding position in the coal markets of South America and the East. Such surpluses as they can spare from their own needs will be sent to Europe, where France and Italy are standing still for want of cheaper coal.

England Still In It.

We give in later sections of this issue some figures relating to Britain's old supremacy in coal production and the wide range of her coal shipping trade. She must be counted as a strong and persistent competitor against all States and nations that do not possess a great shipping business based on the internal requirements of industry and large populations. In not a few cases the return export cargo of coal is a part of the import trade, and since the country must import, her ships outward can carry coal as ballast. In these circumstances the fact that Russia, Germany, South-East and Central Europe, which were great importers of Welsh coal before the War, are now only small consumers will tend to throw English ships into the outside world markets in their search for raw material and food. The disorganisation of Europe and the absence of the old trade exchanges mean that England will have more to spare for more distant customers, and the consequence will be that there may be an earlier recovery of her ocean coal trade than is at present thought probable.

So far, then, as the whole subject of world competition is concerned, South Africa, as we have indicated, has by no means a clear field of supply. The existence of coal in most of the countries bordering on the Indian Ocean and the far-reaching transport organisations of such well equipped communities as those of England and the United States of America, make the problem of coal supply to our nearest oversea markets one of human rather than of physical advantages. We have a cheap and non-revolutionary supply of lower class labour such as should be employed in lower class employments like mining, and this factor is perhaps the chief advantage we possess in this business. There is world-wide labour unrest among the civilised nations, and enterprise will be checked within their borders. Capital will seek less precarious centres of operation.

The Range of Our Subject.

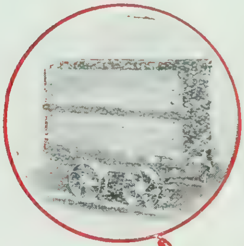
We have in the preceding paragraphs indicated in rough outline some of the matters which must be considered by any State or person who is estimating the chances for and against a large coal business in South Africa. The points put forward bear mainly on the external problems confronting any efforts to enlarge our exports. Questions of our internal coal development are on another basis in so far as they are not affected to the same extent by outside determinants. We have, however, to overhaul our own methods and policies. The need to employ coal, for example, more economically is as insistent on us as it is on the people of Europe. Mining and transport and power problems must be studied with the object of creating our own industries. These depend on our coal resources and will require close and exhaustive study. We shall suggest in the pages that follow the character and trend of these necessary developments. But in the main this special number is a record of existing facts, so far as they are known; that is to say, our railways and harbours and coal mines with their ancillary businesses are the things dealt with. At the same time, where speculation and suggestion may be useful in indicating new roads, or may help to break up retarding conventions and fixed ideas, such as so easily arise to kill industrial growth, they will be offered. At present the War is too near to escape its disturbing influence on old methods and policies. We need new men and new ideas even in half-savage South Africa.

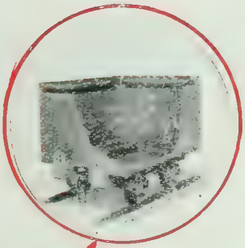
THE HIDDEN VALUES IN COAL.

There is another subject that we shall touch very lightly. The conditions we have referred to above have added greatly to the cost and therefore to the value of coal. Before the War coal was worth only a few shillings per ton, as it is in South Africa to-day. But the working time of the European miner has been reduced and his reward for less labour has been raised. So the value of the labour needed to produce a ton of coal has been much increased, and other costs have also grown. Coal will cost much more henceforward, even if the conditions affecting production are bettered the price of coal is not likely to be less than £1 a ton at the pit's mouth in Europe, at least for years to come. At present it is costing much more than £1 a ton.

This rise in the price of this necessity of all industrial activity will help to save England. It compels her people to get higher values from coal and so balance the higher cost. There is no more important problem in the world just now than the best way of using coal. Germany had gone some way to solve this question before the War, and the partial solution which she had reached was, and is, her chief advantage in the competition for the trade of the world. If the annual output of coal from British mines can be reckoned as worth £2 a ton or more, there will be an increase of coal values of more than 300 millions sterling in comparison with pre-War values. And coal is really worth more than £2 per ton.

We shall outline the new uses of coal sufficiently to suggest the wide field of research open to chemists and technical men, who should lead the way in solving the problem of how to use coal. This country so far as can be judged, will gain more from the practical solution of this question than any other country. South African coals are of second rate quality measured by the old heating standards based on Welsh steam coal; but fortunately there is the prospect that in this new search for values other than heating values South African coals are second to none. It should be an alluring quest.





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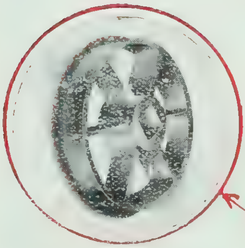

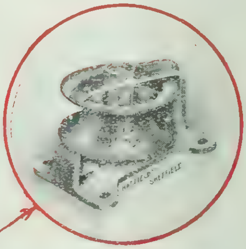

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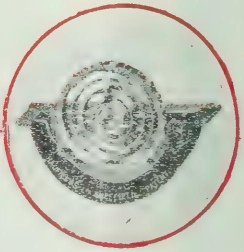

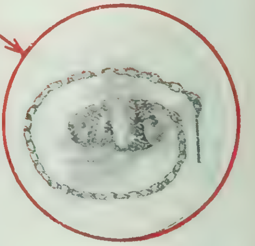

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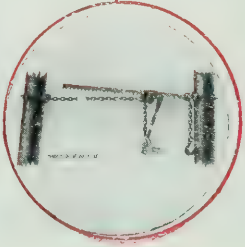

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THE COAL BEDS OF SOUTH AFRICA

THEIR POSITION AND EXTENT

An examination, however slight, of the coal resources of South Africa raises feelings of disappointment and even of regret. A little hope comes in too, but this last is quite a modern, post-War feeling born of the possibility that the evils of the War will create counteracting virtues that will in their compelled exercise reach to coal—even to South African coal, the Cinderella of a Cinderellean continent.

We will deal with this element of hope by and by; let us get the disappointment and regrets into the picture first.

In the first place South African coal is not the real True Blue—or black either. Far away back in Time—or Space-Time according to post-War hypotheses—this planet burgeoned into an amazing life. Why it did so is a question for guessers; but certainly a progressive cooling that finally cooled the waters of the earth to below boiling point was an antecedent condition of the period that saw the rank and swarming vegetation of the Carboniferous age. Perhaps it was the warm water that helped the outburst; perhaps it was the existence of an atmosphere loaded with carbon gases—probably it was the two together.

Not the Best Coals.

Unfortunately South Africa did not, so far as present knowledge goes, come within the boundaries that limited the first and most sustained exhibition of that mysterious outburst of plant life energies. The Carboniferous Age came, flourished and went, and the Earth section we know now as South Africa remained untouched by the special causes that created the marshy flats of reed and fern and tree that formed the floor of what are in these later days the coal beds of the nations. Perhaps the Southern Hemisphere was beneath the surface of the growing seas, much as the greater part of it is to-day below the full oceans.

Then some change came, and after it the conditions that created the coal beds were different. In the second stage there was more movement of the waters and more movement of the muds and silts amidst which the plants flourished. Coal beds were formed indeed, but the sediments invaded the lagoons and marshes and settled with the fallen fronds and leaves and stems and became the coal ash of our furnaces and household fires. The ash took the place of the plants to some extent, and to that varying invasion is due the lower heating value of our South African coals.

The relationships of the Carboniferous and post-Carboniferous periods is a vexed controversy; but it has its economic importance. There is much ground to be yet searched in this Southern Continent and it is important that ideas should not congeal into conservatism concerning the presence or absence here of the beds which were the contemporaries of the coal beds of Europe and America. The point can be made that coal may yet be found below the Dwyka, which all coal miners regard to-day as the "Farewell Rock" of South Africa, below which no chance of discovering coal remains.

The Second Coal Age.

Accepting the usual classification, South African coal beds belong to the Permian formation, or group of strata. They are Permo-Carboniferous, and like the vast majority of the coal beds of that age they are inferior in heating value by about 12 per cent. to the earlier coals of the Carboniferous formations. Great areas of South Africa are overlain by these Permian rocks if we accept the Dwyka Conglomerate as the lowest bed of the group. But, again unfortunately, the coal beds we possess are by no means co-terminous with the Permian rocks—which are no other than the beds that lie over the great spaces of the Karroo, and in addition cover the Eastern parts of the Continent in the Cape Colony and Natal and form the flats and wide swells of the Free State and Eastern Transvaal. These are our coal measures. Plant remains exist over two or three hundred thousand square miles; rocks as far south as the Hex River Mountains and as far north as the Zambesi were deposited at the same time; but only here and there did the plants grow under the forcing conditions that resulted in the formation of coal beds.

Coal and the Karroo Beds.

For immense periods of geologic time the steady deposition of the beds that now form the Karroo continued. Below the Permian lie the Primary rock systems. The Permian are transition deposits. Above them lie the Secondary rocks. Then comes the third great division known as the Tertiary. In this classification the Karroo rocks bridge almost the whole period between the Primary and Tertiary divisions. With their earliest beds air-breathing animals made their appearance on Earth; with their latest deposits we are on the threshold of the coming of mammals.

Just how this great interval of Secondary time must be divided is not yet quite settled; our relations to European time periods are not determined. But the Karroo beds have been classified on South African data and this is the generally accepted table, based on the rock readings of the Cape geologists.

Karroo system	Stormberg series	Volcanic beds. Cave sandstone. Red beds. Molteno beds.
	Beaufort series	Zone of specialised theriodonts. Dicynodon beds. Pareiasaurus beds.
	Ecca series	Shales and thin sandstones. Laingsburg beds. Shales.
	Dwyka series	Upper shales. Conglomerate. Lower shales.

These beds are nearly 20,000 feet thick over all. They are supposed to cover the space of time occupied in the formation, in the Northern Hemisphere, of the Permian, Triassic and Jurassic formations. In them two coal horizons have been determined. The first is down in the Ecca group, the upper one is the lowest member of the Stormberg series, being named "Molteno," as these upper coals are best developed about the village of Molteno, on the Stormberg in the Cape Colony. We shall have little to say about these Cape coals, as they are poorly represented by workable beds. Their evaporative power is low and the percentage of ash is very high, with the result that the mines opened up have been shut down since the better qualities of coal from Natal and Transvaal have become available.

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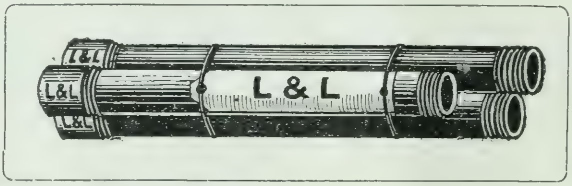

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of the way, though this statement is based more on a

It is the lower series of coal beds, now determined, pretty definitely, to belong to the Ecca group, that represent the economic values of the Sub-Continent. They have been located in Rhodesia, Transvaal, Orange Free State, Natal and Swaziland—an immense territory, over which the coal beds exist in patches mostly of limited extent. Very little has been done to determine the limits of the various fields, and estimates of quantities are little more than matters of individual opinion. But we shall put readers in a position to follow the evidence such as it is.

Northern Coal Areas.

In Rhodesia the Wankie coal field is estimated to extend over a couple of hundred square miles or so, but nothing has been done to trace its limits. A new company has been granted coal rights lately in the country north of the Zambesi. Coal of value with a large percentage of valuable volatiles has been located in the Portuguese province of Angola on the West Coast. In the present stage of our knowledge, however, it would be misleading to mention any figures of quantities in connection with these coals in the sub-tropics and tropics.

Coming south to the Transvaal, coal is found near the Limpopo River, which forms the northern boundary of the province. The coal has been located in limited patches at one or two points, but these occurrences show that the coal beds have been almost entirely removed by denudation and cannot be seriously considered.

The first coal area of fair extent met with coming south lies rather deep below the Springbok Flats in Central Transvaal. A sandstone formation of some thickness known as the Bushveld Sandstone is thought to be the representative of the Stormberg beds and the coal bed that underlies it may belong to the upper series. This opinion, however, is hardly tenable in view of the evident connection of this Springbok Flat area with the Middelburg or main Transvaal coal field.

An outlier of this small Central Transvaal coalfield was worked on a farm only ten miles or thereabouts north of Pretoria. This venture, called the Rogerston Colliery failed to hold its own against the nearby eastern coal mines. The quality of the fuel was, so it is alleged, not so good as that of the eastern mines, opened up along the main railway to Delagoa Bay. Anyway, whatever the cause, it ceased production a number of years ago. Most of these outlying patches, some of which are struck in quite unexpected places, were deposited in hollows in the original surface of the country, and their depressed position has protected them from the all but universal effects of denudation during the long ages that have passed since the lowest coal measures of the Karroo sequence of strata were first laid down.

THE TRANSVAAL COAL FIELDS.

Ten or twenty miles east of Pretoria the coal outliers of the Transvaal High Veld begin. Presently, as one goes eastward, the coal measures became more continuous and the beds are mined to supply the coal extracted by the group of working mines, some of which are described in the section dealing with Transvaal Collieries. These beds are remarkable for the persistence with which they occupy only the higher levels of the plateau. They rest upon the edges of an older formation called the Waterberg, a contemporary, probably, of the Devonian System of Europe. In this position they form a thin crust of sandstones, shales and coals, often not more than a couple of hundred feet thick and rarely increasing to 400 or 500 feet.

The main economic consequence of this beggarly tenuity will be realised at once. Everywhere the shallow valley streams have cut into valuable coal beds and removed them seawards. If the covering of coal measures had been stouter, or, rather, if civilization had existed a million or two years earlier, those immense losses would have been forestalled. One feels like the carpenter in "Alice in Wonderland," and inclined to shed a bitter tear as the realisation of the vastness of the mischief done by these maids of Nature, the rain and the wind, is forced on the imagination. But like spilt milk the weathered coal has gone into the ewigkeit.

The Lost Coal.

Another consequence of the late arrival of gold mines and Stock Exchange speculators, who were a couple of million years too late, is that only a very close and detailed survey, supplemented by bore-hole tests, can estimate how much of the coal measures has been removed, and how much remains in this eastern area, and, further, how much of the upper coals has been removed, even where coal beds exist. Originally the whole area was covered with coal strata, but not with coal, because the coal was deposited, as in France and other coalfields, in lagoons. These occupied the hollows in the older tilted Waterberg rocks, some of the lagoons being of large area and others small. Thus these older rock margins of the ancient morasses stick out through the existing coal measures here and there and help further to reduce the extent of the coal beds. A small sketch giving an ideal section, will be of service in elucidating what it is essential should be understood, namely, that it is useless to multiply length into breadth in order to get a rough estimate of the quantity of coal remaining.

The Extent of the Coals.

There is coal distributed over a wide area of the High Veld in Eastern Transvaal. Along the northern limits—excluding outliers already referred to—coal is found over a distance of 75 miles. The continuity of the beds along this east and west section, is fairly good, and the beds have been opened and developed sufficiently to allow an estimate of the average thickness to be made. This we may call the Witbank line. Another cross section from west to east, between the East Rand and Ermelo, is again in coal most general survey than on proof that coal actually exists at any one point. The places mentioned can be located on the railway map we publish.

But the southern limits of this coalfield cannot be laid down, even on the roughest lines. First: denudation has played its part; then there is the fact that though the Natal coals may underlie portions of South East Transvaal, no business man would risk a cent on such an assumption; he would demand some proof that the coal beds existed before putting down any money.

The distance from a point east of Belfast, on the Delagoa line, southwards to a point south of Ermelo, where the coal beds begin to outcrop along the falling gradients of the High Veld escarpment is, say, 80 miles. Thus the Transvaal coal beds are found over an area of not less than 6,000 square miles in South Eastern Transvaal, and, theoretically the quantities contained in such an area would be considerable. Unfortunately, however, no geologist has attempted to define the position and boundaries of the various patches of coal measures found in this area, and until this is done no engineer would attempt to estimate the extent of these denuded strata. He would be, perhaps, content to guess that one-half or one-third of these square miles contain coal; but there would be no approach to unanimity among his fellows on the conundrum. If, then, we assume that there may be 2,000 square miles of coal measures scattered over the High Veld of the Eastern Transvaal, it must be accepted for what it is—a guess, determined by the fact that coal is found at various points over districts not less than 6,000 square miles in extent.

A GREAT FREE STATE FIELD?

The guess is also subject to what follows concerning the coalfields of the Orange Free State. Fragmentary representatives of the coal measures appear as one comes southwards towards the valley of the Vaal River. Near the river these outliers merge into a continuous coalfield, which, so far as the scanty evidence goes, is the largest unbroken area

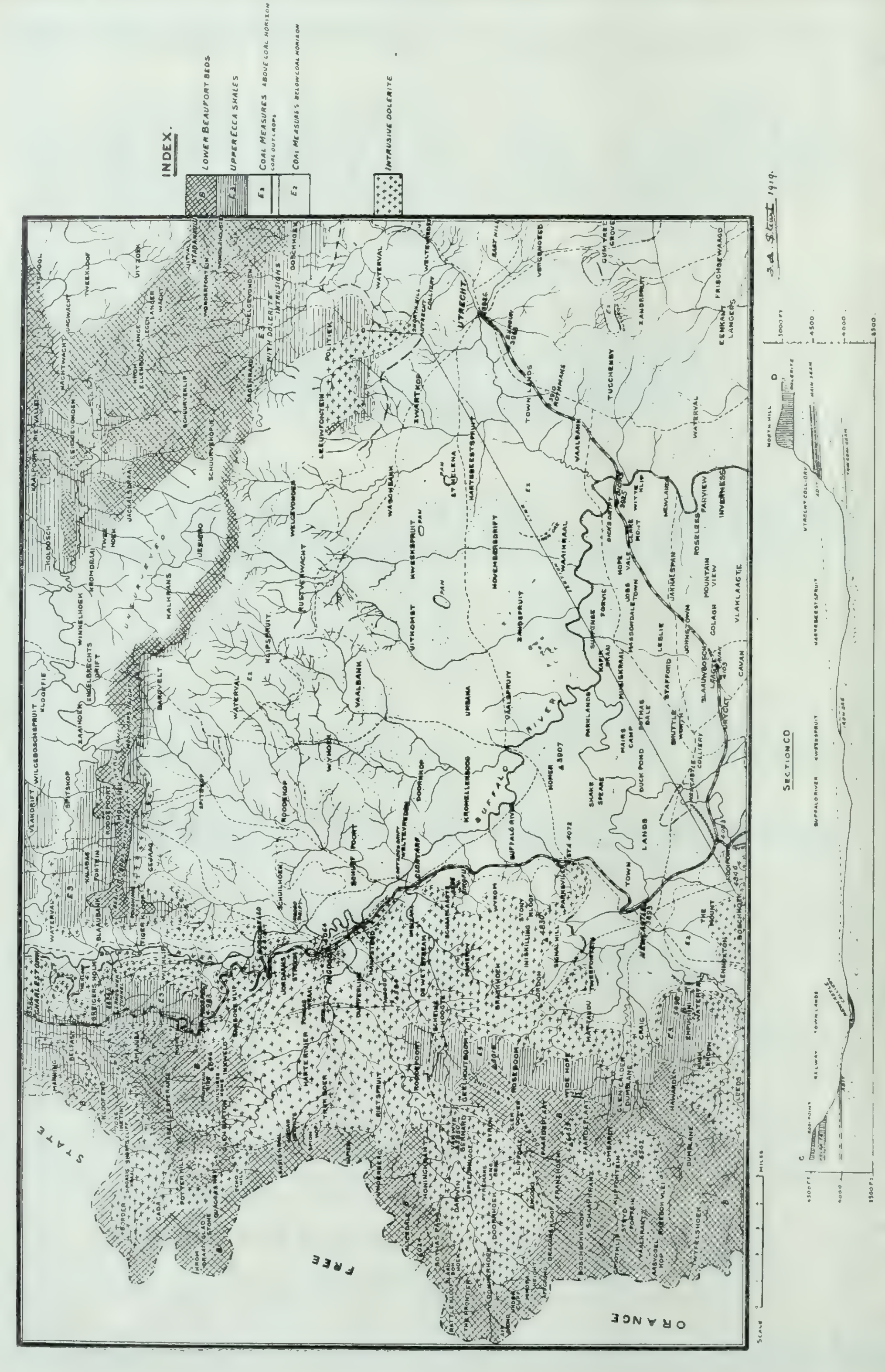


DIAGRAM I.—Maps of northern portion of Natal Coal Fields, showing surface distribution of rock strata. *From F. A. Steart's paper on Natal Coal Fields.*

of coal yet located. In this southern direction, as in the east in Natal, the coals lose their lagoon-like discontinuity and become more like European coal beds, with continuous seams that can be identified over wide stretches.

This Free State coalfield begins east of Heidelberg on the north (Transvaal) side of the Vaal River, and continues into the northern districts of the Free State for an unknown distance. But coal is found near the Vaal River in the property of the Kroonstad Coal Company, 120 miles as the crow flies from the north-eastern limits of the field east of Heidelberg. Whether the coal seams are the same is again a matter of guess work.

THE KARROO RIDDLE.

The difficulty in determining the extent of this Free State field arises from the fact that the edges of the Karroo strata that abut against the Witwatersrand formations near Heidelberg run clear away in an unbroken sheet east and south for hundreds of miles. They are a part—the lower beds—of a system that covers two or three hundred thousand square miles of the Cape, Natal and the Free State. All the evidence strongly favours the inference that somewhere in the Free State these coal beds run out into barren rocks. Boring in the Cape Colony, hundreds of miles away, failed to locate coal in the lower Karroo rocks, and it is improbable that coal exists in the Ecca beds in the Cape Colony. Only at one point down towards the distant southern escarpments of the Karroo mass, has coal been found. A careful study of that isolated coal occurrence has been made, and the conclusion come to is that it is not a true bedded coal; it is coaly matter that occupies a fissure in the Karroo rocks. If coal, truly bedded, should at any time be found in that remote southern district, then it would be permissible to believe that South Africa is perhaps a great coal country and that great areas of the Karroo system probably contain coal beds. Even at great depths, as they would be, they would nevertheless alter the whole aspect of this coal question.

FREE STATE AND NATAL.

Now this northern Free State coal runs an undefined distance eastwards, towards Natal. Karroo rocks extend far away into the Drakensberg where they form the bold escarpments that dominate Natal. And along these escarpments the Natal coalfield crops out. Is there any continuity between the Free State coalfields and the outcropping beds in Natal? If such questions were answered a closer estimate of the extent of our coalfields would be possible. As it is, the Free State field can be estimated in almost any figures. If it extends say half way down the Free State, and if it extends, as it may do, from near Klerksdorp, in the Transvaal, for 250 miles east to Glencoe in Natal, the estimates of South Africa as a coal [illegible] would go up considerably. We should be justified in figuring on a coalfield covering 20,000 or 30,000 square miles.

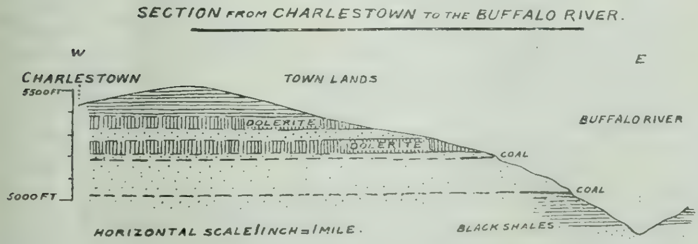
THE NATAL HOLOCAUST.

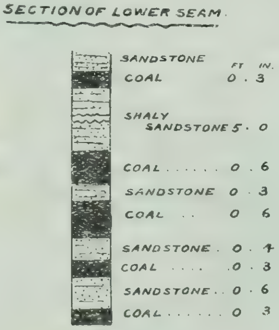
There remains the Natal field. Here we are on surer ground, and, again unfortunately, it is not too firm. More attention has been paid to the Natal coalfields by geologists. A recent examination was made by Mr. Steart, who read a paper before the Geological Society on the subject. By the courtesy of the Secretary, Mr. Jago, we are permitted to produce the map which illustrated the paper, together with a section which is of much interest in that it shows that the Natal coal seams pass under the summits of the Berg and enter the Transvaal High Veld at a depth of several hundred feet, thus indicating that the connection of Natal coals with the coal beds of Southern Transvaal and Northern Free State is possible.

BURNT-OUT COALFIELDS.

Apart from its coal values, a subject dealt with in another section, the Natal coalfield is the most disappointing of all South African coal areas. The immense energies expended in the lifting movement that raised the Drakensberg, wrought havoc along the whole of the Natal front exposed along the mountain slopes. Every observer has commented on the widespread destruction caused by the volcanic intrusions and lava flows that accompanied the crumpling of this mountain chain. Mr. Wm. Heslop, writing a year or two ago about Natal coal, thus described the effects: "The extent and continuity," he wrote, "of these intrusions (of volcanic rocks) is without a parallel in any coalfield in the world. In other fields the igneous intrusions may be on a larger scale, but the extent of lateral travel in the shape of sheets is very much less. A vertical intrusion (dyke) will, by the heat emitted at the time of extrusion, deleteriously affect the coal for some yards on either side, but the horizontal sheets frequently affect the coal over areas many square miles in extent. Between Hatting Spruit and Dannhauser, and extending east and west, there is an area of over 50 square miles in extent affected in this manner. Some years ago the writer estimated that about three-quarters of the Natal coal areas were affected by igneous action. Subsequent exploration and investigation indicates that 90 per cent. would have been a much nearer estimate, and that of the total coal areas of Natal not 10 per cent. can be considered of sufficiently good quality for present-day market requirements."

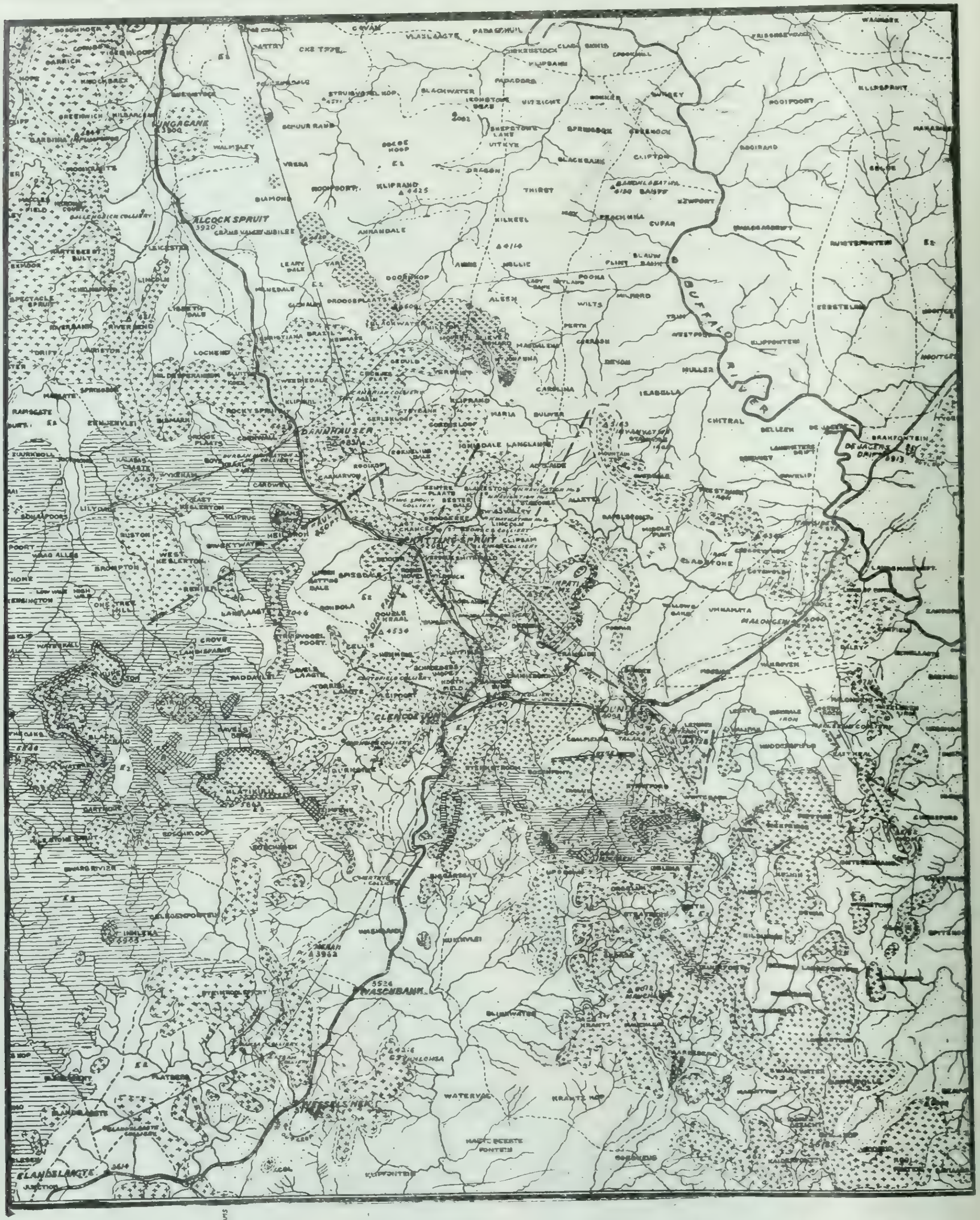
Comment on these sweeping assertions is made unnecessary by the map we publish. It shows how plutonic rocks have invaded the field and largely destroyed it, and if, as Mr. Heslop, a competent observer, declares, only 10 per cent. of the 10 per cent. left from the holocaust is of marketable quality, a situation that demands the attention of every public man in Natal exists.


SECTION FROM CHARLESTOWN TO THE BUFFALO RIVER.


SECTION OF LOWER SEAM.

ONLY HALF LEFT.

But this is not all. Situated on the slopes of a mountain range, very large sections of the Natal coalfields have been denuded and washed away. This is particularly the case in



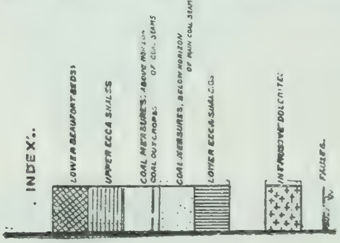


DIAGRAM II.—Map of lower section Natal Coal Fields, giving geological sketch of area about Glencoe.

From F. A. Steart's paper on Natal Coal Fields.

the Vryheid District, where the remaining coals are found in the mountains. The photographs of the Inyati Colliery—received too late for insertion in their proper place—show clearly how great valleys have been worn in the Karroo beds, leaving only isolated hills as the guardians of the coal treasures. There is very little coal left in the Vryheid District. A rough estimate suggests that 90 per cent. of the coal beds have been swept away by the denuding forces operating in the shaken and dislocated area of disturbance.

And of the minor areas that remain in the detached hills of the district a very large proportion has been damaged by the igneous sheets of which Mr. Heslop speaks. Sometimes the intrusion is vertical, that it, a dyke which forms the resistant core of a group of hills; sometimes a sheet of dolerite has flowed over or between the beds and has so protected the underlying strata—has in fact made the hills possible. But everywhere there is evidence of the destructive power of the fiery dykes and flows of molten rock.

It is very unfortunate that those earth movements acted where they did, because there is evidence that in the ancient swamps that created the coal stable conditions of growth and decay existed in those Natal areas. Over wide reaches the coal seams were laid down in continuous beds, the remnants of which exist to-day over hundreds of square miles. It was a great and valuable coalfield when the Drakensbergen began their wrecking work upon it. To-day the solitary hills stand apart, mere broken columns of a once mighty treasure house.

No Estimate Possible.

Again, it is impossible to make any estimates of the quantity of coal. The hopeful aspect of the Natal position is suggested in the note on the Orange Free State field. As the vertical section published in Mr. Steart's paper shows, their beds run in under the Transvaal plateau at no great depth from the surface, and the presumption is that as they retreat from the disturbed area so will the quantity of undamaged coal increase. The only drawback from the Natal viewpoint will be that most of this probable extension will be Transvaal and not Natal coal.

THE COAST COAL MEASURES.

The list of coal districts in South Africa is not yet exhausted. Up to the Vryheid line and even nearer the coast the coal beds of the Ecca formation manfully maintain their high elevation. At Witbank the altitude is a little over 5,000 feet above sea level. Coming southwards to Ermelo this altitude is maintained, for at the last-named centre the coal beds are still about 5,000 feet up. Farther to the South East, about Vryheid in Natal, the level has come down some 500 to 700 feet lower. This dip seems to increase eastwards towards the coast, until near the sea the coal measures take a definite dip of 10 or 20 degrees downwards and become an outcrop line over a distance that is yet undetermined.

A Long Coal Line.

In South Zululand this outcrop has been attacked by Natal firms, and a coast-railway extended into Zululand from Durban partly for the sugar traffic and partly for the expected mineral traffic; but these attempts were discontinued and the usual explanation "inferior quality" obtained currency.

These coals are known to be anthracitic and heavy in ash; but not much else is known. The strike of these beds, which are of no great thickness, is northwards past St. Lucia Bay into Swaziland, and thence still northwards along the line of the Portuguese-Transvaal boundary for an unknown length of country.

It is possible that it is the extension of this coalfield that has been taken up in Zambesi territory. [illegible] a brief account of the evidence so far [illegible] regarding this northern coal field. Much work must be done before it can be linked up with the coal measures that we have been dealing with. According to the reports published the development of this Zambesi coal is to be taken up vigorously.

In Swaziland this coal line is held by private concessionaires and the reports concerning the values are favourable. Further north, however, near Komati Poort, the coal was opened up some years ago, but the results were not encouraging, if we may judge from the fact that these ventures were abandoned. At that point the Union Railways have marked off a Coal Reserve, but do not appear to have done anything to test the value of the reserved area.

A Low Grade Coal?

Generally the evidence of the value of this coast line which would be of great economic importance if high-grade coals are found along it, is unfavourable. Where attacked it has been abandoned after the preliminary testing. These tests, however, have been made at long distance intervals owing, doubtless, to the fact that it is only at one or two points that railway transport is available.

As to the probable quantity of coal in this coast line the figures are dependent upon further proof as to the continuity of the coal measures from South Zululand up to the North-Eastern Transvaal—a distance of several hundred miles. Owing to the seaward dip the workable breadth of the coal measures is limited and may be put at five miles. The thickness of the beds is reduced compared with the inland figures, and much of the coal would not be workable.

THE UPPER COAL MEASURES—THE MINES IN THE CAPE COLONY.

In a short notice such as this, concerned mainly with economic results that can be measured, very little space can be given to the Molteno beds, which occur high up in the Karroo system, and were probably of Jurassic age. Where opened up along the continuation of the Drakensberg escarpment, to the south, the coal beds are thin and of poor quality. In addition the seams have suffered as much as or even more than the Natal beds from volcanic agencies, and by far the larger sections of the beds have been destroyed for practical mining purposes.

But it is the low quality of these upper coals that rules them out of the economic picture. For many years the Cape Railways made gallant attempts—at the expense of the stokers mainly—to keep alive the legend that Indwe and Molteno coal were possible industrially. But in vain: and two or three years ago the pretence was abandoned. The result was that the few working mines, deprived of their markets on the railways, and working at a high level of cost, owing to unfavourable conditions, closed down. Consumers prefer other coals, even though the cost is a good deal higher.

Some Coal Calculations.

We have given a short outline of the position and probable extent of the known coalfields of South Africa. No doubt there will be small extensions traced here and there. Coal measures exist, for example in German South-West Africa and may contain workable coal seams. On the whole, however, the claim that South Africa is a great coal country is not proven: the evidence is all the other way. The values we shall deal with presently; but apart from these, the coal seams of South Africa are not found in great permanent seams as in America and Europe. A field of this character that may exist lies roughly along the upper valley of the Vaal River; the boundaries of the other fields can be pretty definitely located.

What, then, do the coal resources of South Africa total? At present this is an idle question. It is enough to know as we show in dealing with specific cases in our colliery sections, that areas containing hundreds of millions of tons of coal are available. It is only when comparison is made with other countries that South Africa takes a back seat. Britain claims a hundred thousand million tons. The States claim three million millions and vast unmeasured deposits of lignite and oil shales as well. In such company we must [illegible] a very small [illegible].

But those who seek to work out some figures for themselves may take the following basic calculations. An acre contains 4,840 square yards. Thus every foot in depth gives 43,560 cubic feet per acre, there being 9 square feet in every square yard. The specific gravity of coal varies, but as a rule South African coals are heavy owing to the greater percentage of ash. If we take 25 cubic feet of coal to represent one ton of coal in its original bed, there are 1,700 tons of coal or thereabouts for every foot of depth in every acre. (The Cape land measure gives [illegible] English acre.)

Consequently a ten foot seam of coal would give 10 times 1,700 tons; and an average thickness of 20 feet of coal would give 20 times 1,700 tons—that is 17,000 tons and 34,000 tons per acre respectively.

Now a square mile measures 640 acres, and the rough result is that a square mile of land that has 20 feet of workable coal under it, contains 20 million tons of coal.

This is the theoretical figure. Engineers make tremendous deductions and arrive usually at quite unreliable under-estimates in all those cases where the coal miner works his coal beds by modern coal saving methods.

With these figures before him any one who thinks he knows the square milage area of South African coalfields can arrive at figures that will astonish his friends.

COAL MINING IN SOUTH AFRICA.

MEANING FIGURES

Shewing Results for 1918.

CAPITALISTS and others at a distance who desire to estimate the dimensions and the forward movement of coal mining in South Africa will find the information they need set out in the appended table of statistics which summarises the main results obtained in 1918 from all the coal mines of the country. Read with the wages figures which follow this table, all the information necessary to ascertain the quantities of coal produced in the main centres of coal mining and cost of the labour item can be obtained.

COAL (Ton=2,000 lbs.).

Area and Province.	No. Mines in Dec.		Mining.				Coal Sold.		
	Producing.	Non-Producing	Feet sunk, Producing and Non-Producing Mines.	Tons Mined.	Tons of Waste Sorted out of mined.	Percentage of Waste Sorted to tons mined	Tons.	Value at Pit's Mouth. £	Value per Ton. s. d
Springs-Brakpan Area	3			654,957	124,797	19·05	501,845	126,991	5 0·73
Middelburg Area ...	18	1	882	5,816,601	632,928	10·90	4,955,165	1,281,301	5 2·06
Other Areas	10	1	124	1,140,326	101,148	8·87	981,951	224,069	4 6·77
Transvaal Total	31	2	1,006	7,611,884	858,873	11·30	6,438,961	1,632,361	5 0·84
Cape Total	2		—	5,140	555	10·80	4,654	3,566	15 3·89
Heilbron	2	1		868,228	34,499	3·97	782,630	214,426	5 5·76
Kroonstad	2			58,185	11,285	19·40	43,947	15,310	6 11·61
Orange Free State Total .	4	1	—	926,413	45,784	4·94	826,577	229,736	5 6·70
Dundee, Klip River, and Newcastle	16	.	2,223	2,355,152	450,043	19·11	1,746,022	1,001,199	11 5·62
Utrecht, Vryheid, & Paulpietersburg	9	2		1,076,633	194,998	18·11	861,111	357,735	8 3·70
Natal Total	25	2	2,223	3,431,785	645,041	18·80	2,607,133	1,358,934	10 5·10
Union of South Africa .	62	5	3,229	11,975,222	1,550,253		9,877,325	3,224,597	
Year 1917	66	4	1,453	12,817,378	1,868,192		10,382,920	3,275,608	-
,, 1916	63	2	2,324	12,281,798	2,042,952	—	10,007,502	2,739,665	-
,, 1915	59	5	3,197	10,053,869	1,591,941		8,281,324	2,142,479	- -
,, 1914	58	3	2,885	10,220,018	1,588,314		8,477,923	2,258,896	
,, 1913	61	-	2,452	10,732,653	1,827,348		8,801,216	2,240,458	—
,, 1912	65	6	2,685	10,059,037	1,920,647	- -	8,117,078	1,999,378	
,, 1911	62	4	1,943	9,931,327	2,263,854		7,594,944	1,935,153	-

WAGES STATISTICS.

The average pay for white men employed in the coal mines of the Union of South Africa was in 1918 £33 per month.

Some of the details are as follows:—

	Average pay per month.
Carpenters	£35 15 5
Fitters	37 16 3
Smiths	36 12 4
Others	35 0 0
Hospital attendants	25 6 8
Overseers	30 0 0
Storemen	17 0 0
Weighbridge men	23 17 1

In the Transvaal the total sum paid to white miners on coal mines in 1918 was £300,832; in the Cape the total paid was £437; in the Orange Free State the total was £51,129; and in Natal £296,636.

In the few mines that are taking out a little coal for local markets in the Cape Province the average native wage, per month, was £3 11s. 3d. Such native females as are employed at the Cape mines get £1 per month.

In the Orange Free State coal mines the average native wage per month is £2 11s. 2d.

ASIATICS AND NATIVES.

Natal coal mines employ a considerable number of Asiatics, who earned a total sum of £82,506 during the year. The average wage of these Asiatics, who get somewhat better food than the natives (that is more expensive food, such as peas, oil, etc.), was £2 11s. 9d. A few Indian females were also employed, mostly in work of a domestic character, and their wages averaged 19s. per month.

Compared with the Indian miners, Natal native coal miners draw a smaller wage, being more mechanical and less intelligent. The total of the wages paid to natives working in Natal coal mines was £259,070, and the average wage paid per month was £2 6s. 2d.

BY-PRODUCTS—COKE, TAR, ETC. (Ton=2,000 lbs.).

The by-products produced from coal are small in quantity, but such as they are they are given hereunder.

Area and Province.	Coke.			Tar.			Sulphate of Ammonia.		
	Produced. Tons.	Sold.		Produced. Gallons.	Sold.		Produced. Tons.	Sold.	
		Tons.	Value. £		Gallons.	Value. £		Tons.	Value. £
Dundee, Newcastle Area	15,947	14,127	28,746	—	—	—	—	—	—
Utrecht, Vryheid Area	17,886	17,612	39,916	—	—	—	3,281	2,503	86,299
Natal Total	33,833	31,739	68,662	—	—	—	3,281	2,503	86,299
Union of South Africa	33,833	31,739	68,662	—	—	—	3,281	2,503	86,299
Year 1917	15,372	15,361	28,648	—	—	—	—	—	—
,, 1916	10,704	10,704	19,575	—	—	—	—	—	—
,, 1915	7,279	7,279	12,880	26,050	26,050	881	—	—	—
,, 1914	6,493	6,493	12,377	2,225	2,225	124	—	—	—
,, 1913	9,345	9,345	15,862	43,293	43,293	1,433	—	—	—
,, 1912	7,960	7,960	11,980	25,895	25,895	806	—	—	—
,, 1911	5,544	5,544	7,544	41,352	41,352	1,411	—	—	—

Over the whole Union the wages paid to white men in 1918 as under:—

Staff	£83,901
Other white employees	212,735
Total	£296,636

Over a period of years since Union the totals are as follows:—

Year.	
1917	£523,461
1916	455,074
1915	401,349
1914	412,175
1913	413,259
1912	386,032
1911	356,904

NATIVE WAGES.

Native wages paid in the Transvaal during 1918 averaged £2 9s. 8d. per month. Food and lodging are given free, and the cost is part of the wages paid. The lodging and food cost amounts to perhaps a shilling a day.

General results as to total wages earned by coloured miners in the coal mines of South Africa are set out in the following table:—

Union of South Africa—

Asiatics	£82,751
Asiatic females	319
Natives and others	680,545
Natives and others—females .	134
Total	£763,752

The progress made by coal mining during the last eight years is suggested by the increase in the total yearly wages paid as follows:—

Year.	
1917	£760,407
1916	714,512
1915	596,966
1914	579,647
1913	542,962
1912	493,497
1911	485,286

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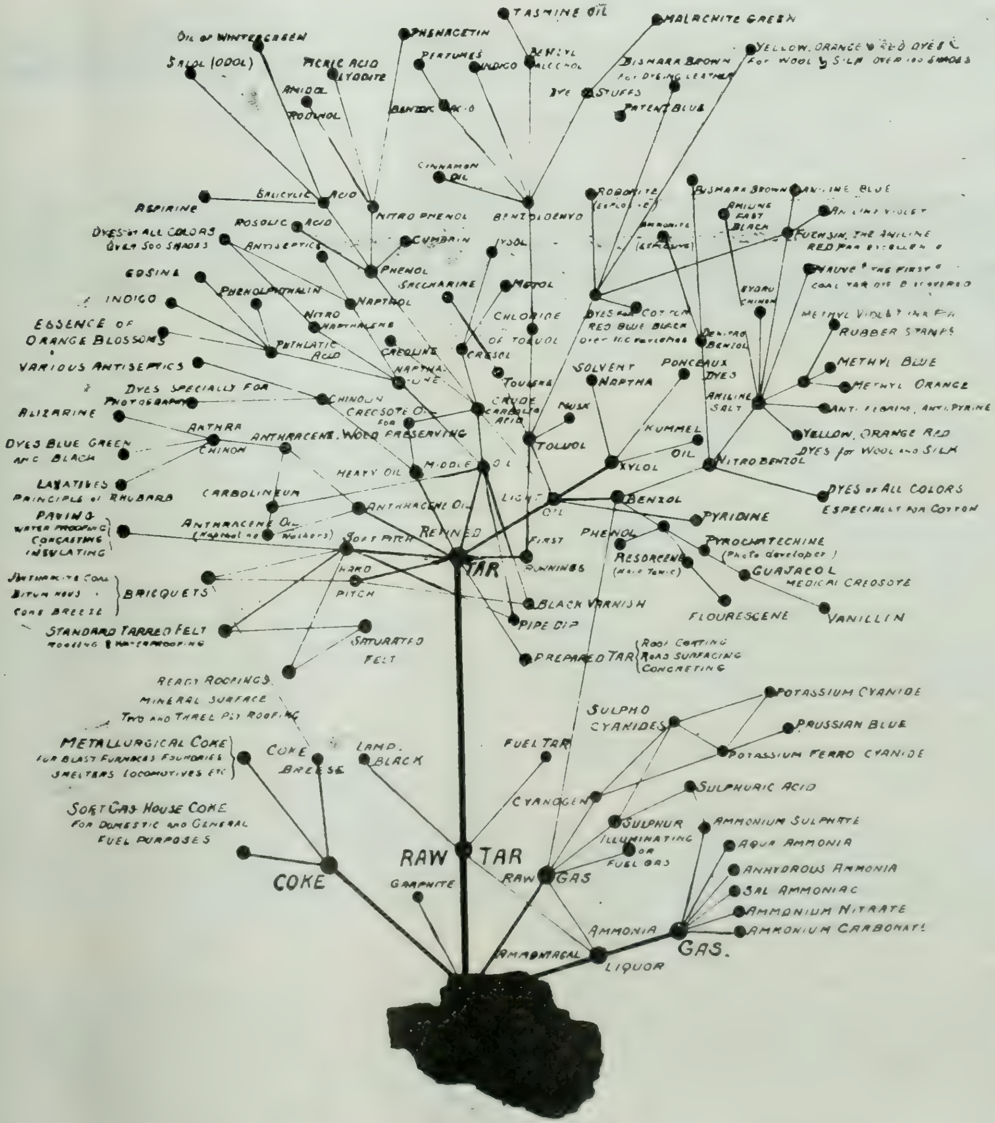
THE BY-PRODUCT INDUSTRY

THE INDUSTRIAL POSSIBILITIES OF COAL BY-PRODUCTS.



BY-PRODUCTS FROM COAL.

The above graphic sketch illustrates in a striking fashion the many by-products obtainable from coal, and indicates the many varieties of industry that may be built up upon the vast coal deposits of South Africa.

SOUTH AFRICAN COAL VALUES

STEAM AND BYE-PRODUCTS

BEING in the beginning of things, South Africa is still using its coal to boil water. The figures we have given as to quantities produced and sold relate almost entirely to what may be called the kettle department. Railways took a million and a half tons of coal for the making of steam to pull non-paying train loads of goods and other things about the veld. The mines consumed another large fraction of the total annual output of about 10 million tons to heat their boilers; and household fires used, with the ships boilers, nearly all the balance.

Low Heat Values.

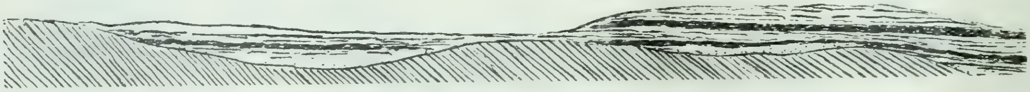
Very little of this coal went into smelting iron and such businesess. These have still to come. It is a pity that we have not got a little farther on the road of industry, because South African coal does not shine as a water boiler. Its weakness as a heating agent seems to be that being a Permian, or comparatively late coal, the oxygen it originally contained as peat or lignite has not yet been eliminated, and the heat values are thus lowered. In the other class, namely, the anthracitic coals, the percentage of ash lowers the calorific values—as it does of course in the bitumites also.

If we could find any of the older coals better heat values could be obtained.

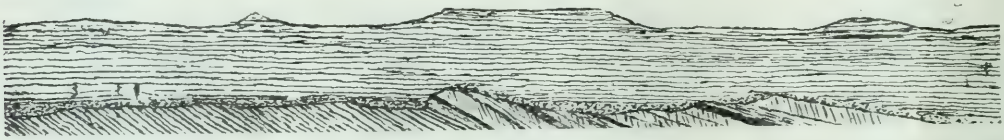
A Gambling Chance.

While passing it may be pointed out that the Karroo system of rocks covers very large areas in South Africa, areas very much greater than the extent of England, Scotland and Ireland combined. Usually the true coals of the Carboniferous period are unconformable to the post carboniferous coals; but even if they are conformable in South Africa, there may exist areas of considerable extent in the Free State and northern Cape Colony in which the carboniferous coals may underlie the Karroo rocks. There is little evidence of the existence of such rocks, but if the Karroo beds overlap the older carboniferous all round the horizon, the latter may still exist in basins in the inner regions occupied, as we have said, by the Free State and Upper Cape Province.

This means that the idea that the Dwyka Conglomerate marks the lowest limit of the lowest coal measures may be a mistake. In all cases in the areas mentioned boreholes should be sunk into the beds below the Dwyka in the hope that a field of Carboniferous coals exists below the later rocks. It is probable that the coal age of the earth is represented in South Africa by coal beds: this is a fair preliminary supposition. If it did extend to the Southern Hemisphere it is somewhere under the Karroo rocks that we may hope to find it—under the Dwyka that is. An ideal section that represents this possibility would be something like this:—



I. Ideal section showing denuded coal measures of Transvaal lying on older tilted rocks.



II. -Ideal section showing Karroo beds of Free State and Cape Colony overlying older rocks, including possibly true carboniferous strata that may contain valuable coal seams.

This section shows that the Karroo measures may be barren, and yet coal may exist in wide carboniferous pre-Karroo basins now hidden by the great thickness of rocks since laid down upon them. This supposition would not be reasonable if the Karroo system covered only limited areas; but when it covers, as in this case, the half of a sub-continent, the chance of finding the lower coals that were contemporaneous with those of Europe has quite a different value.

England Prospecting for Coal.

A reference to the present explorations being carried out in Britain will justify this suggestion. Years ago it was obvious to any one who knew the terms of the Coal Commissions' Report that considerable areas of hidden coal existed in England. The most sensational of the discoveries made later was in Kent, but other extensions were proved in other parts of England and Ireland. In Kent the Carboniferous rocks dipping at an angle have been proved to contain many valuable seams of coal characterised by low ash content and high heating power. An average analysis of the Kent coals shows the volatile contents to be about 20 per cent., carbon 75 per cent., ash 4 per cent., and sulphur 1 or less. The calorific power ranges in such coals about 15, and the quantity so far proved amounts to about 1,500 million tons of marketable coal.

Heating Values, Transvaal and Natal.

Drilling for coal beds has not yet been put into systematic action in South Africa. Doubtless such developments will come later. Till they do come, and possibly alter the present estimates of the heating value of our coals, we must do the best we can with the coals we possess. Their grade varies from acre to acre almost, and analyses are for this reason of limited use. But as a rule the ash content must be classed as high, being in the bulk about 12 or 15 per cent. of the total weight. Sulphur ranges usually above one per cent., and less than two. The volatiles in the bitumites are also higher than European coals. A series of analyses of Transvaal coals from leading collieries give the following percentages of volatiles:—27, 24.31, 24.16, 25.27, 24.50, 27.53, 28.52.

It is obvious that such percentages of ash and volatiles bring the percentage of fixed carbon down to the neighbourhood of and below the sixties, which may be taken as the average carbon figure for Transvaal coals of better quality. In Natal, however, the percentage, both of ash and volatiles, is lower than the figures just mentioned, and the corresponding rise in the percentage of fixed carbon is reflected in the higher calorific and better steaming qualities of Natal coal. Their ash ranges about 12 per cent. (we are dealing with the commercial qualities of coal) and volatiles about 22 per cent., with carbon, accordingly, up about 66 per cent.

Our Relative Position.

The broad result is that the average calorific value of the coalfields so far opened up is maintained at the standard demanded of 12.5 only by picking out the best seams and best sections of seams. This value may be reckoned all round at about 11 calorific. Much of it is between 10 and 11, and a smaller proportion is below 10. We cannot unfortunately get away from these facts which should constitute the basis of our coal policies. It should be admitted that the usual extravagant method of using coal as a water heater does not pay in South Africa, either privately or nationally. Compared with the older coal beds of Europe we are lower by 1,500 thermal units or thereabouts. In support of this conclusion separately arrived at, the opinion of Mr. T. G. Trevor, the Government Mining Inspector of the Pretoria division, may be quoted. Writing in the last Annual Report on Mines—that for the year 1918—he declares that: "As I have before pointed out, the standard evaporative power of over 12, usually about 12.7, which has been adopted for marketable coal in the Transvaal is exceedingly high when compared with the normal coal of the country. Attention is specially drawn to this by the action of the Victoria Falls Power Company at Vereeniging, which is taking nearly the whole unsorted output of the Cornelia Mine. This mine takes out the whole seam without sorting or picking, and the fuel as supplied to the power station has a calorific power of only about 10, . . . and the station which is one of the largest in the world is said to produce its power at less cost than any other.

"This demonstrates conclusively," continues Mr. Trevor, "that coal of as low an evaporative power as 10 should be of the greatest economic importance, though it is usual at present in estimating the workable quantities of coal in the country to disregard as unworkable all qualities below 12."

A Ruinous Standard.

Thus the subject even of the heating value of our coals is one to be studied before general conclusions can be drawn. To estimate on the 12.5 basis involves cutting out three-fourths of the coal resources of the country. Mr. Heslop, whose opinion regarding Natal's coal reserves is elsewhere quoted, confirms this official opinion about the wastefulness of this calorific standard. It must be accepted as proved that South African coal has a low calorific value when compared with foreign coals. This is a primary fact that should influence coal legislation and coal mining and coal uses.

The Thickness of the Seams.

As regards the other value factor, namely, thickness of seams, evidence is adduced in the detailed accounts we publish of some of the Transvaal collieries, pointing to considerable thickness of workable coal. It will be convenient if we take this as proved, at least so far as the Transvaal district about Witbank is concerned. Nevertheless we may quote Mr. Trevor again, and so secure official sanction for our own evidence on this point. He writes in the same Report:

"Taking fifteen shafts and borehole sections in the Witbank Coal Fields and disregarding all coal seams under three feet in thickness, I find that the average coal in the sections is 29 feet 11 inches. But of this 29 feet 11 inches the average thickness being worked in thirteen collieries in the district, is only 7 feet 4 inches. I am informed on all hands that the seams unworked and the disregarded portions of the seams which are worked would certainly give coal of an evaporative of 10 or over. A large proportion of this coal consists of upper coal left behind in the present workings which could be broken down and hauled at a very small cost. When one considers that when once the present mines are abandoned and the unworked coal in these sections will no longer be obtainable, the enormous waste of national wealth in the present system of mining and utilising the fuel will be realised."

This last comment of an experienced observer reminds us that the demand of the railways for cheap high grade coal is helping to ruin the coal mines of the country. The Government appears to exist in separate watertight sections, none of which has any knowledge of the benefits and the mischiefs it is trailing along outside its own watertight tub.

From the above very brief reference to our coals when estimated as sources of heat energy it is plain that the country is handicapped greatly in any competition with outside coal selling competitors. We must seek further and analyse coal values more narrowly before any conclusion can be drawn. We pass on then to consider other coal products.

THE PRODUCTS OF COAL.

New Vistas of Value.

Many readers are familiar with the table we publish setting out the manifold carbon combinations that exist in coal. But few consider it seriously; they are accustomed to regard heat as the main product of coal and all else as a by-product. As a fact it is the heat that is a by-product. Coal's real wealth is mainly in its carbon, nitrogen and multitudinous compounds of carbon and hydrogen, just as the value of an oak tree lies in its timber and tannin and not in its heat-making fires. The worth of the so-called by-products far exceeds, when measured in money, the fuel values; nevertheless coal must remain the chief source of fuel for many great industries such as iron smelting, and for this reason a much more careful use even of its fuel values is necessary. The coal burned off for fuel must be burned with knowledge and all its energy extracted.

England is beginning to discover these truths. So is America; and more is done in consequence to utilise coal resources than ever has been done before. Lecturing recently at the British Scientific Products Commission, Westminster, Dr. H. E. Armstrong, Professor of Chemistry, said:

"It is impossible to overrate the gravity of the situation in which our industry is placed by the sudden great rise in the price of coal; we can only meet this by economising in its use and by improved methods of using it.

"I have long been an advocate of the need of a national policy with regard to fuel and power. . . . But the question to be considered before all others—the question of questions in regard to coal—is whether or no the direct burning of raw coal shall in any way be permitted in future. I would forbid the domestic use of all coal which can be carbonised economically at a low temperature prior to use as a fuel.

"If this point of view," he went on, "can be made to prevail, our entire outlook will be changed. We shall first direct our attention to the development of methods of carbonising coal which will enable us to conserve the volatile matters, whilst at the same time producing an easily combustible smokeless fuel suitable both for domestic and industrial purposes."

The Line of Progress

[illegible]

any in Britain, an indication of the lines of progress in coal consumption. Coal is a vastly complex chemical substance containing many organic compounds. These can, and in terms of Professor Armstrong's demand, must be extracted before the remainder of the coal is put to fuel purposes. When coal is carbonised three main products are obtained (1) a solid fixed carbon product called coke, (2) liquids, water and tar, and (3) gas.

These three main products can be varied as to yield and character—within certain limits—but the best and most profitable method of coal solution has not yet been determined. In this research chemists have a great field of work before them. How variable the results may be is indicated by this extract which we make from an article published in *Engineering and Industrial Management*:-

"The process," it says, "may be divided into stages; from 215 to 225 degrees (of heat, Fahrenheit) the moisture is removed; from 300 to 400 deg. Fahrenheit, slight superficial softening of the coal takes place and some gases are given off, but the character of the fuel is substantially unaltered; at 450 F. decomposition into paraffin oils, gases and solid substances begins, the mass fuses, swells and loses weight, and if distillation is completed a porous coal is left; at 750 deg. F. new gases and vapours are liberated, accompanied by a marked increase in the volume of the mass, and the development of a porous cellular structure; at from 825 to 950 deg. F. the liberation of oils is more rapid, and in one hour a 36 per cent. volatile coal is reduced 50 per cent. in volatility, and the apparent specific gravity of the residue is about 0.75 (i.e., less than that of water); at very high temperatures, 1,500 to 3,000 deg. F. the volatile hydrocarbons are practically entirely removed and the carbon residue raised to great hardness."

A NEW VALUATION.

It is in such a process that the successive steps are reached on the way to a complete disintegration of the coal as is set out in the table published. How does South African coal come out in such a comparison with European coal?

The answer is: Very well. A greater percentage of volatiles may mean more tar and more oil and more derivative compounds, most of which are of great commercial importance. Germany led the way in the commercial exploitation of coal products. Everyone has heard of the German development of tar, of aniline dyes, and of the disinfectants and drugs obtained from the same wonderful fountain of mystery. The British chemists are many miles behind the Continent in the scientific treatment of coal. Coke ovens for by-products bear non-British names, as do many patented processes for extracting the differing coal products—clear evidence that there has been neglect and apathy in English factories and laboratories regarding the higher uses of coal.

THE FIRST BY-PRODUCT.

Usually the solid carbon of coal is converted into coke, which is the porous residue that remains after the volatile matters have been driven off by heat. In the ordinary bee-hive oven this volatile percentage is driven off as gas and is lost. This is the process in use in a few coal mines in Natal that have installed ovens for making coke. The first and simplest attempt to use coal scientifically is to reduce it to coke. Coke when burnt in a strong blast generates greater heat than ordinary coal and is the fuel used for iron smelting. About two-thirds of the coal remains behind as coke after this bee-hive process of burning away the quick-flaming elements.

In South Africa the proportion of coke obtained is somewhat less than two-thirds, except in specially selected coals. So far very little coke has been produced in South Africa. We give, however, the history of the beginnings of this industry which is establishing itself at present about Vryheid and Glencoe, in Natal. We give also a comparison of good English coke and good Natal coke. This will enable readers to see what can be done with carefully selected coals. But all South African coals are not suitable for coke and there is evidence that very little attention has been paid to the matter or to the discovery of suitable coals.

AN ADVERSE REPORT.

This carelessness has already reacted on the reputation of South African coke. The War caused a sudden expansion of the demand. Production went up from 15,000 tons in 1917 to 32,000 tons in 1918. Some of this War coke was of low quality. Writing of the copper industry in Cape Colony the Mining Inspector of the Cape and Orange Free State, Mr. G. E. B. Frood, says in his latest published report:

"Last year gave excellent results and both the companies (Cape Copper) made handsome profits. The reasons for this sudden transition this year are quite clearly ascertained, the chief being (1) the difficulties with supplies. . . .

"The coke difficulty was perhaps the most serious of all. The Natal article was more or less available, but did not provide a suitable substitute for the English, which was practically unobtainable. The Cape Copper Company, after some trouble, was able to get along with Natal coke, but only at a loss of about 25 per cent. furnace efficiency and at more than double the cost—weight for weight—of English. The Namaqua Company, perhaps owing to a more refractory ore, could only manage by mixing English coke with Natal in the proportion of 1:3."

As against this adverse opinion it is fair to quote the comment made by Mr. Trevor, the Pretoria Inspector of Mines. Commenting on the attempt to establish iron smelting at Pretoria he wrote:

"The coke was obtained from Natal. That at first received was unsatisfactory in that the sulphur content was too high, but later a perfectly satisfactory coke was obtained. The furnace charge was a mixture of siliceous ore and clay-band, and from the first a perfectly good reduction and a good liquid slag was obtained. For the first two months the iron remained 'white' and it was not till the third month that a good 'No. 4 grey pig' was produced."

THE PRICE OF COKE.

This conflict of evidence can probably be explained by the attempt of coke producers to take advantage of the high prices for coke due to the War. At one time South African coke was selling for £13 or £14 per ton. The present figure is about 90s. wholesale.

A reduction then of about one-third of the weight in an ordinary bee-hive oven enables the coke-maker to sell his coke at about 20 times the price of ordinary Transvaal coal, or ten times the price of Natal coal. It is the first reward for the increase of labour and knowledge bestowed on it. This result will no doubt react on the making of coke in South Africa and when a real demand springs up it will be satisfied. We need not fear therefore for South African coal in the coke markets. What is wanted is a coal free from sulphur and reasonably low in ash, and these coals no doubt exist. The immense quantities of coke required in industrial countries reacted on the manufacture of coke, and as the demand arises here so will the average quality improve. We are still a long way, however, from such plants as that now being put up by the Carnegie Steel Company. The bee-hive oven is disappearing in America and special so-called by-product ovens are being built by the Carnegie Co. They take 13 tons of coal at a charge. In all 1,500 ovens will be used, handling over 12,000 tons of coal a day. The process in this case drives off the volatile elements only, leaving two-thirds of the coal as coke, which is required in the smelting furnaces.

SOME BY-PRODUCTS.

Here is a list of the products which this plant will produce. It throws light on the importance which industrial men now attach to coal.

First, 8,000 tons daily of furnace coke and 1,400 tons of small coke and coke dust. The volatile portion will give 150,000 gallons of coal tar every day, being 12 gallons of tar per ton of coal treated. In addition the nitrogen will make 162 tons daily of sulphate of ammonia, that is 25 lbs. per ton of coal. The gas driven off in the process is equal to 6,000 cubic feet per ton (of 575 B.T.U.) or 75 million cubic feet daily. This surplus gas is of course used for heating purposes, etc.

As regards the tar and its oils, the product is pretty much what is desired. The figure given alone for tar production at this big plant does not include, it appears, benzol products, which must be added to the list. It is given as 29,000 gallons of pure benzol, plus other oils.

The Scientific View.

A first step in the better use of coal is the building of special ovens for burning off its various products. Bee-hive ovens lose all the valuable elements, except the coke. At a recent meeting of the Coke Oven Managers' Association at Sheffield, England, Dr. Gray, the Superintendent of Laboratories at the National Fuel Station, said it was surprising to find that coke was still being made by "this primitive and wasteful method," that is, the bee-hive oven process. It was little less than a scandal, he said, that the development of the country should have been so slow. The first step to reform was to ensure that scientifically and technically-trained men should enter the industry, which was now a highly developed chemical industry. He added that his Department had plans in hand to undertake experiments on high temperature coking. It was also intended to experiment with regard to regulating the temperature in its effects on the quality of the coke and the yield of the various by-products and also the development of the coke oven itself. Possibly too much attention had been paid to ammonia recovery: the tendency had been to sacrifice everything to get a high yield of ammonia. In his opinion the ammonia market would not be so favourable as it had been and they would have to think in terms of £8 and £10 per ton for ammonia instead of £12 and £16. They were faced, too, he said, in Scotland with the problem of the coming exhaustion of the high-grade coals, and they would have to face the necessity of using lower-grade coal or semi-coking coals.

South Africa's Position.

This brief statement of opinion by a competent authority indicates that the last word in coking has not yet been heard. The coke oven will become more than ever a chemist's box of marvels. South Africa has, in a sense fortunately, all the world to consult in any expansion of her coal industry. She can begin where others have arrived with difficulty and at great cost. But the essential lesson is plain. She must begin where science now is, and if she wants to make her coal worth pounds, where it is now worth shillings, knowledge and technical skill and enterprise are the first needs.

For example, the values of sulphate of ammonia, referred to by Dr. Gray as unstable, depend upon the development of agriculture. Everywhere, it seems, new methods, intensive methods are needed. The market for sulphate of ammonia will become more certain and stable as time goes on and stability is a greater factor in production than a narrow uncertainty. We possess one factory which has led the way already in this new field of the utilisation of the comparatively large percentage of nitrogen contained in South African coals. The account we give of the plant and methods employed at the works of the Natal Ammonium Company will be read with interest. And the point should not be missed that a single coal element constituting only 2 per cent. of coal beds can, in the hands of technical experts, produce values which, at present levels, are many times greater than the whole value of the coal used merely as a heating agent. It should be a lesson to the whole country of what trained intelligence means and it must be said that the demonstration deserves the attention of the Government and Legislature, who cannot now plead ignorance of our coal values.

The Tar Values.

This higher yield of nitrogen is a justification of our assertion made above that South African coals will compare favourably with European coals in any comparison based not on heat values, but on chemical analysis. We have higher nitrogen figures. And the tar comes out well also, though our experience in this respect has not been unchequered. Some years ago a big gas power plant was put down for the Johannesburg Municipality and its failure was attributed to imperfect cleaning of the gas from tarry impurities. Anyway it failed, and its failure even reacted on England, where Germany was allowed to take the lead in the development of gas as a power producer. Again, a tar plant put in by the Witbank Company was closed down. Recent news is that it is to be tried again, probably with modifications.

Little evidence exists, therefore, concerning the average tar content of South African coals. Tar is taken out by the Johannesburg Municipality, but the coal supplied is doubtless a selected quality. Some figures published on this matter by the Council read as follows:—

Price of Coal per Ton	Gas Yield in cubic feet	Coke and Breeze Yield per Ton of Coal	Tar Yield per Ton
22s. 3d.	9,312	1,365 lbs.	14·1 gallons.

It may be added, for the entertainment and consolation of Municipal Councillors less fortunately placed, that the Johannesburg Municipality sold the gas at 3s. 8d. per 1,000 feet, values the gas coke at 15s. per ton of coal, and the tar at 1s. 5d. per gallon; making the total value £3 4s. 5d. for the gas, coke and tar produced per ton carbonised.

Doubtless, as we have said, this is coal of special quality as may be judged by the price paid, namely 22s. 3d. per ton. But the coke still shows a brave percentage and the volatiles cannot be excessive in spite of the large amount of gas obtained. We cannot, however, accept these results as representative of tar values, which vary here as elsewhere. Nor can we say anything concerning the analysis of South African tar, or whether it is specially rich in any element. These things are for the future, when an enlarged Department of Industries is equipped for such necessary work.

NEW HEAT VALUES.

Enough has been said above to suggest reasons for the present extraordinary impulse manifest in England towards a better understanding and use of the wonderful industrial values bound up in the common mineral that has for nearly a century been wasted without stint in our fires and furnaces. It is beginning to be realised that coal is a precious mineral, a wonderful lamp whose magic has only now begun to be dimly appreciated.

An Awakening

This feeling has led to the appointment of many Commissions in Britain beginning with Fuel Economy and Fuel Research Commissions and going on to a Nitrogen Committee. For the first matter of importance is to get out higher fuel values for those industries, such as iron smelting, that require heat. Quite an amazing story of neglect and indifference is revealed when the history of this matter of the past use of coal is studied. A Fuel Committee consisting of Professor Bone, Sir Robert Hadfield, and other authorities, recently presented a preliminary report on the subject of waste of heat values. They say at the outset of their report that their object was to study the present state of fuel consumption and they pay great attention to the problem of using surplus blast furnace and coke oven gases which hitherto have been wasted. They say, too, that it has been shown that the heat of these surplus gases has

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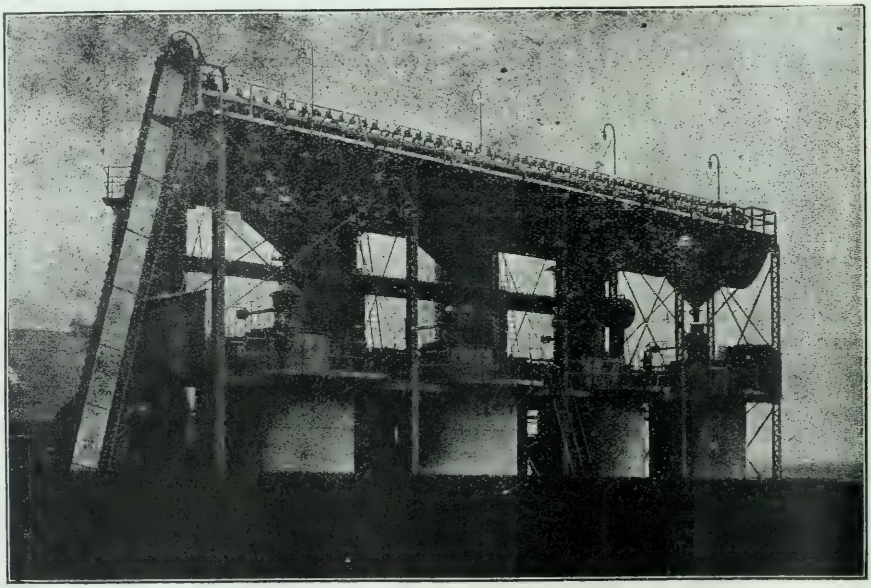

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been shown to be sufficient not only for converting molten iron from the blast furnace into steel but also for rolling the resulting ingots into finished steel sections. Continental chemists, they say, have led the way in the improvement of the old beehive oven and the utilisation of its surplus gases. Belgium has shown us what can be done with blast furnace gas in internal combustion engines, and Germany and Sweden have revealed the merits of cleaned gas that can be used in power generation. They conclude the first part of their report by declaring that they are warranted in regarding the consumption of no more than 1·75 tons of good coking coal per ton of finished steel sections as a practical ideal for a modern plant.

Light on the Cost of Steel.

This figure of 1·75 tons of coal per ton of finished steel is set as the immediate goal in the iron and steel smelting industry. Such a quantity of coke could be produced in South Africa for a very small sum. The mining of the coal needed would not be more than 8s., and the coking, if proper plant is employed would not cost more than 12s. more. Handled on a large scale, cheap coke will be one of the greatest advantages that South Africa will possess to set against her higher costs in other departments of a smelting industry.

Getting Better Heat Values.

But this employment of gases in steel production is only a single aspect of the fuel problem. Study and research has begun in all industries using coal, with the design of securing greater efficiencies. At a Midland iron company an investigation showed that the over-all thermal efficiency was only 2·26 per cent.! A modern coke burning plant was installed and the surplus heat used as far as present-day knowledge permits. The net result was that the heat efficiency all round was raised to 20·13 per cent.

According to a statement made after expert examination in 1913, the heat efficiency of England's central power stations was at that date only 8·5 per cent. In these cases the coal is burned under the best conditions with automatic stokers, heat-saving appliances, etc. It would be interesting to know what the thermal efficiency in the power stations of the Victoria Falls Power Company in the Transvaal is, but such information we have not been able to obtain.

Doubts About Electricity.

The whole subject of fuel efficiency is of vast importance to all users of South African coals as these coals give low results when burned in open grates. The charges made by this company have recently been attacked as too high when contrasted with the services rendered to consumers possessing plants that run with full loads only intermittently. Criticising these results recently, Mr. H. W. Clayden, A.M.I.E.E., who read a paper on the subject, declared that "the average figure on two mines is 2d. per ton crushed in favour of the electrified mine when purchasing power at 0·525d. (the company's price per unit) on a 60 per cent. load factor due to a group factor of 70 per cent., and the other mine still running the old steam plant of 20 years' standing, both mines crushing the same tonnage. This figure does not include the cost of air supply."

As electric power may be regarded, in some sense, as a by-product of coal, inasmuch as it is generated at large stations from small waste coal, this subject of the cost of electric power is of the first importance to those who are looking to the generation of electricity as a step towards greater economy and efficiency. Recently a report was submitted by Messrs. Merz & McLellan, who investigated the problems connected with the employment of electrical power on South African Railways. The evidence about the relative thermal efficiency in electric power stations and in ordinary steam plants should be thoroughly examined before any large and expensive plans of conversion are adopted. This report has been published recently and its terms need not be summarised. Four railway lines are selected by the experts as suitable for the electrification. The Government will no doubt go seriously into the questions raised, as the provision of greater and increased doles to the rapidly growing railway staff is becoming urgent; but we would urge that the facts should first be thoroughly investigated in the light of recent knowledge and research into fuel economies in Britain and elsewhere, before many millions of public money are spent.

Fortunately we shall not be entirely dependent on outside sources for evidence, as one or two attempts will be made in Natal in the near future to instal modern by-product ovens for the manufacture of coke, and the resultant tar, benzol, etc. The Dundee Coal Company, Ltd., for example, is putting up Coppee ovens, the plans providing for an extension to 50 ovens. These will produce coke and tar, ammonia, and benzol. Other companies are contemplating similar improvements in the treatment of their coal, and from these experiments it will be possible to investigate the best methods of using the heat evolved.

A blast furnace is also to be erected at Newcastle, Natal, for the manufacture of iron pipes and heavy iron and steel castings.

THE VIRTUES OF GAS.

Some Conclusions.

Though no definite action on a large scale will be taken in England till the report of the Fuel Research Board is published some time this year, it is already clear that the issue as regards the heat values of coal lies between electric power stations burning coal in open fires, and by-product furnaces producing gas and coke. And it is also already evident that the verdict will be in favour of gas and its residual products such as coke and tar. The use of coal of whatever kind in ordinary boiler furnaces gives the low percentage of efficiency already mentioned of less than 10 degrees in a hundred. On the other hand, by taking out the gas and tar and burning these separately the percentage rises to 70 or 80 per cent. At the annual meeting of the British Commercial Gas Association recently, Sir Dugald Clerk stated that after the completion of carbonisation the three main products, namely, gas, coke and tar, were capable of evolving 71 per cent. of the original total heat of the coal.

This is a statement that is of first-hand importance. It will be tested to the uttermost and if proved correct will revolutionise the practices now employed in the consumption of coal. No business man could avoid the claim from the public that the coal of the country shall be used as profitably as skill and knowledge will allow. It is a demand that will certainly arise in England now that the value of this mineral is beginning to be known; and it ought to arise in South Africa where as our articles indicate the waste of valuable carbon fuels is immense and senseless. Sir Dugald Clerk went on to say that though 71 per cent. was the average obtained, there were many works giving an efficiency as high as 82·7 per cent. Of this percentage about one-third can be obtained from the gas and the balance from the coke and tar: that is, the gas will yield 25 per cent. of the original heat, and the other two products will yield 50 per cent.

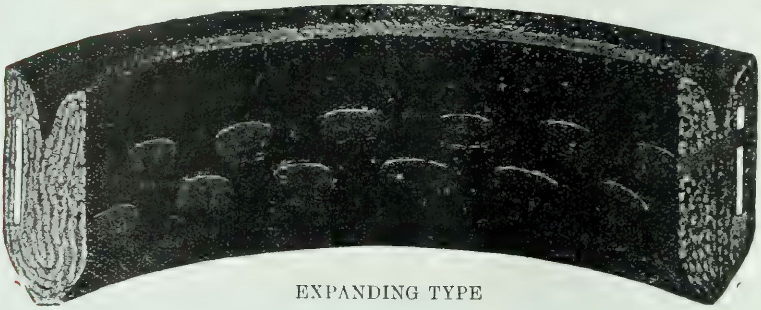
A Saving of 90 per cent.

On these rough figures it seems already possible to estimate. Of the ten million tons of coal we now produce we secure the heat of less than one-tenth in our open fires. By converting the coal into its separate products we would save nine million tons. Eighty per cent. of the heat of a million tons is equal to 8 per cent. of the heat of ten million tons. Plainly we are here on the borders of facts of national importance that call for action from the Government, the Legislature and the leaders of industry. As we have shown, the evidence so far uncovered is against the hypothesis that South Africa is a great coalfield. But we have all the coal we are likely to need for centuries, if only we use it in the right way and insist that users shall not waste it.

The Position of Electricity.

Another deduction from the facts is that if electricity is to be used as a convenient and portable form of power the burning of coal at the central power stations must be on the lines we have mentioned. The coal must be so burned

—This—



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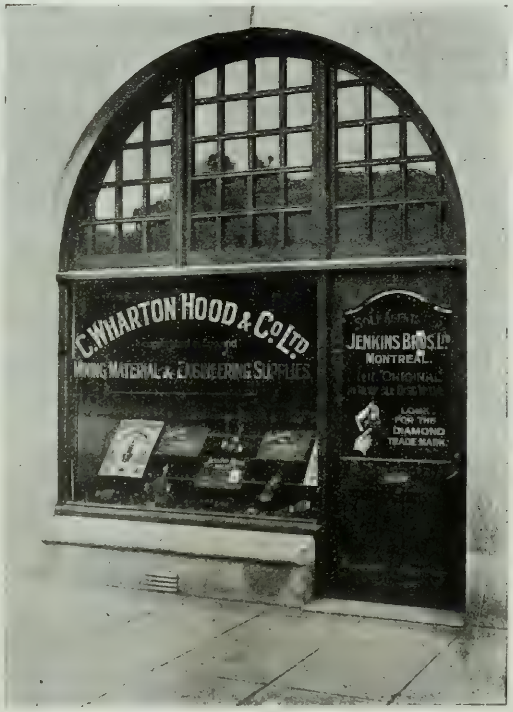
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as to extract 80 per cent. of its heat. This means that the tar and gas must be separately treated. If this is done throughout the country the necessary coke for steel and other industries will be produced in quantity and the tar and gas can be treated as need and circumstances may dictate.

Alcohol from Gas.

There are big values in tar, values that are as yet not fully revealed. Almost every month some new discovery is made by those engaged in coal research work. It is therefore a mistake to decide just yet on the sites and plants of the 16 great central power stations which the British Government proposes to erect for the generation of electricity. A little more research may save a great deal of money and prevent the early scrapping of the power plant. For example, Messrs. Bury and Ollander, who were working during the War at the works at Skinningrove, read a paper on 15th December last detailing their successes in separating Ethyl Alcohol from coke oven gases. They obtained a yield of 1·6 gallons of Absolute Alcohol per ton of coal--equal to 3·2 gallons of proof spirit. As they point out, this means that the consumption of grain can be reduced, etc. It also means that the by-product coke ovens of Britain can produce 23 million gallons, and the gas works 27 million gallons of alcohol per year. These quantities added to the benzol produced which should amount to 64 million gallons, make a total of 114 million gallons of motor spirit, or two-thirds of the total quantity of motor spirit consumed in England.

Wait and See.

The circumstances, we think, call for a pause in the erection of great electric power stations of the old pattern. If the Government of South Africa intends, as Mr. Burton has hinted, to electrify great sections of our railway lines, he should wait for a year or two before taking any steps to locate or equip such stations. We may see soon a scrapping of all existing plants. That 80 per cent. of the total heat in coal is a revolutionary figure whose significance does not yet seem to be grasped.

Our Chance to Help.

And there is another development which seems to offer great possibilities in South Africa, where great distances are a permanent disability. Much is being done now to test the value of pulverised coal. It seems to possess many advantages that outweigh the additional cost. The coal is reduced to a very fine powder, fine enough to pass most of it through a 200 mesh screen. The cost of this crushing is about 2s. per ton. When coal is so powdered it becomes nearly as flexible as oil. On our locomotives and ships it would save a vast amount of human labour. The furnaces would need to be specially designed, as the powdered coal is blown into them by a regulated air blast which is limited to prevent any explosive mixtures of air and coal dust.

The results are declared to be revolutionary compared with the old methods of firing, though it must be said these results are still fiercely challenged by the old hands. Economy is claimed up to nearly 50 per cent. on present methods of firing. But obviously this is the least advantage. The saving of transport and labour would be immense in all departments, as the coal dust can be transported all over an extensive plant as easily as gas. And in ships its advantages are obvious. No more tropical stoking.

Again it will bring all our lower-grade coal into action and if proved successful will in this respect alone add thousands of millions of pounds sterling to the value of our coalfields. Every five shillings of value added per ton of coal means 25 millions sterling on every 100 million tons of coal—quantities that exist on many individual properties at work to-day on our coalfields. It is stated that trials on an American cruiser over an extended period showed that powdered coal generated in one boiler as much heat as two oil-fired boilers of the same size—another revolutionary result if the figures are confirmed!

NATAL AMMONIUM, LIMITED.

The creation of the Natal Ammonium Company in 1913 broke new ground in the South African coal world. It began to use coal, not for heating water for steam purposes, but burnt off the coal in order to obtain a chemical element that the anthracite coal in the Vryheid district contained in rather greater amount than other coals. This element was nitrogen. There is not much of it in coal as a rule, but the small additional percentage contained in certain anthracite coal seams in that district caused the Brunner-Mond interests, so well known in the manufacture of alkalies in England, to decide to spend money on the recovery of nitrogen from Natal coal, and its combination with sulphur into sulphate of ammonia.

The Forming of the Company.

This is in no sense a new process of obtaining fertilisers from coal. Sulphate of ammonia is a recognised coal by-product. But it was somewhat unusual to adventure large sums of money for the recovery of this single by-product and throw away the rest of the coal. It was the 2·2 per cent. of nitrogen in these particular anthracite coals that tempted the chemist—the same percentage in coking coals is less valuable.

The company was floated in 1913. It took over from other syndicates whose titles were set out in the prospectus, certain freehold rights over portions of three farms covering 2,600 acres in all. The vendors took £113,000 for their rights all in shares. They got 13,000 preference shares of £1 each and 100,000 ordinary shares. Apparently the seams of coal common in that district and known as the Alfred and Gus seams exist on the lands purchased. They are of a combined thickness of 10 ft., and the coal is very anthracite.

The company took shape as a venture with £325,000 total capital in £1 shares of two classes, 100,000 ordinary shares which were given to the vendors and 225,000 preference shares all of which, excepting the 13,000 already mentioned, were offered to the public at par. These preference shares carry 7 per cent. interest. After payment of this interest the surplus profits are divided between the ordinary and the preference shareholders.

The Aladdin Trick.

With the money so obtained the Aladdin trick was carried out on the slopes of the Ngwebi Mountain, for, as usual, the coal seams are in the hills. Terraces were cut, trimmed stone and brick cottages and other buildings put up for the staff; offices, hospital and hotel—or boarding-house—provided. And in addition the chemical reduction of the coal called for elaborate buildings, retorts, towers, furnaces, and sulphuric acid chambers. To connect with the outside world a light 2-foot railway to the Hlobani line at Boomlaager was laid down. When the Mauritius investors, more confident, built the full gauge railway past the Natal Ammonium property to Enyati, the small 2-foot railway was taken up and half a mile of full-size rails laid down to connect the chemical plant with the Enyati railway under, of course, a contract to contribute so much per ton carried. To-day a "caboose" attached usually to empty coal trucks, brings travellers to the Natal Ammonium Mining village—for village it already is

The Chemical Plant.

The plant for the extraction of the nitrogen is elaborate and expensive. All the plans were drawn in England, and the machinery and other equipment sent out in full confidence that the whole process would work out as designed. The coal comes from the mine to the ground below the retorts which are great iron cylinders some 10 feet in diameter, and is lifted after reduction and screening to nut size to the chargers above the retorts. These chargers contain a bag or two of coal and drop the coal as required into the retorts. In the latter the usual burning off of the carbon takes place. The lowest layer is ash and above is

Encouragement of Industries
AND THE
Development of the Natural Resources
OF THE
UNION OF SOUTH AFRICA.

IT is perhaps unnecessary to state that there is great scope for the establishment of new industries and the expansion of existing industrial enterprises in the Union of South Africa, but as it may not be generally known what facilities are available to the public for obtaining advice and information regarding the mineral and other resources of the Union of South Africa and regarding the industrial possibilities of the country, the following notes on the activities of the Department of Mines and Industries may prove of interest :—

MINING SECTION.

The Department has available *a large fund of information* on the various minerals which occur in the Union, and interested parties can avail themselves of it at all times. Applications for such information should be addressed either to the Inspector of Mines of the district in which the mineral occurs, or to the Government Mining Engineer, P.O. Box 1132, Johannesburg.

When published information is available, the applicant will be supplied with a list of reference to such literature, but if little or nothing has been published, the Department will furnish such information as is at its disposal. In the case, however, of statistical information supplied by any particular mining concern under the Mines and Works Act and Regulations, this is regarded as confidential and can only be divulged with the consent of the party who furnished the returns.

Specimens of minerals are identified free of cost to the applicant by the Director of the Geological Survey and should be sent to his Office at Pretoria. If any information is needed as to the uses and commercial value of such minerals, this is also supplied.

Assays and quantitative determinations are made in Johannesburg, by arrangement with a local analyst, at a low scale of charges, of which particulars can be obtained from the Government Mining Engineer. Samples for determination should be forwarded to his address, P.O. Box 1132, Johannesburg. For special analyses a fee will be charged by arrangement.

INDUSTRIES DIVISION.

In the Industries Division of the Department a wide range of valuable industrial and commercial information has been collected in regard to the natural resources of the Union, sources of supply of raw materials required in industry, the uses to which these materials may be put, the processes of manufacture and machinery required, the facilities for the establishment of industries and so forth. This information is available to the public and effort is made to supply to every enquirer the fullest information on industrial and commercial subjects. In cases where the desired information is not already available, the Industries Division is prepared to initiate specific enquiries and investigations concerning industry and commerce.

The Department issues monthly a Journal of Industries in which information of industrial and commercial interest is given and the Journal makes a feature of reports on the resources of the Union and opportunities for industrial development.

For information on these subjects enquiries should be addressed to the Secretary for Mines and Industries, Union Buildings, Pretoria.

the burning coal driven into fierce heat by the draught from the fans. But the heat must be controlled and the draught is moderate. Even so, however, it is necessary to reduce the temperature at times and steam from the boilers is used to effect this and maintain a due proportion between the carbon gases and ammonia generated.

The process continues till all the carbon is burnt - distilled—off and, in the form of gas, passes into a great main of rivetted iron plates. This main carries the gaseous products of 24 retorts, each some 10 ft. wide by perhaps 30 feet high. Night and day the distillation continues, for the retorts are of the continuous type and are built with their ash discharge valves 15 or 20 ft. above the ground level. Nothing but the ashes, consisting of sand, clay, iron, etc., passes out to the waste heap; the carbon in its vapourised form passes along the iron main, which, to save space, doubles back parallel to the long double line of retorts.

Then it is passed through water, and the dust which has been carried along by the blast is washed out. It forms a black sludge, which is also thrown aside at present. This sludge contains potash and some ammonia, and is a moderately valuable fertiliser. But the law, fearing for the farmer on his barren acres, forbids the sale of these lower grade fertilisers. Everywhere else the farmer can look after himself, and knows that flue dust is only of moderate value—and pays accordingly. But in this progressive Union the Minister of Agriculture knows better!

The Vital Reaction.

Then comes the making of the valuable product, the sulphate of ammonia, The nitrogen gas already united with the hydrogen of the steam as ammonia passes with the carbon gases into the absorber wherein dilute sulphuric acid forced through a row of nozzles as fine spray combines with the ammonia and mingles with the heated water in the absorber as a solution of ammonium sulphate. The following is the equation usually given as exhibiting the chemical reactions involved in this conversion:—

$$2\ NH_3 + H_2\ SO_4 \quad (N\ H_4)_2\ SO_4$$

This means in practical business that the fertilising product becomes three times the original weight of the ammonia. Sulphur, itself an expensive element in South Africa, has been added to the precious nitrogen—of which there must be a few billion tons in the air about us—and the resultant sulphate of ammonia becomes in the present market worth £27 10s. a ton. This, we understand, is the price quoted at present.

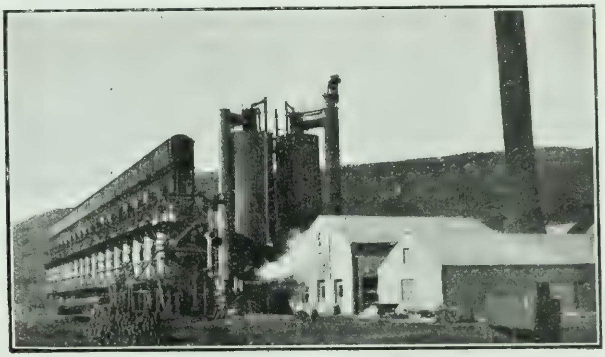
The sulphate in solution is drawn off with the water, and after being crystallised out, is dried in a centrifugal dryer, and is ready, in the form of a dirty-white sugar product, for bagging and sending off to buyers.

A Waste of Gas.

The rest of the process is not at present of much practical importance. A little tar is got by passing the gas through a tower, but the bulk of the gas is allowed to escape into the air. There is always a lambent blue flame, seen at night, playing above the towers. It means the destruction of thousands of cubic feet of valuable carbon gases. A fair proportion of the gas, however, is carried to the furnaces and burned there under water boilers to provide the necessary steam power for fans, electric light, shop and mining purposes. To see these clean and effective chambers of intensely heated gases at work is to get a glimpse of the power plants of the future.

There is another great building near the main works where sulphuric acid is manufactured. Railways do not like to carry this corrosive vitrol, so the companies using sulphuric acid manufacture for themselves from pyrites, which so far as the Natal Ammonium is concerned are supplied from pyrites concentrating plants at Natal Spruit, near Johannesburg.

A number of interesting questions are raised by the work of the Natal Ammonium Company. Whence, for example, comes the nitrogen in this coal? Mr. Robertson thinks that it is of organic origin, and was absorbed by the original coal plants from the air about them. The burning off of the volatile matter in the seams of coal may account for the increased percentage of nitrogen. This burning off certainly assists the working of the coal in the retorts, as there is no troublesome caking and clinkering to break up as the distillation progresses. The guess behind this idea is that anthracite is a de-volatilised coal—which has yet to be proved.



Natal Ammonium General View—Retort on Left.

But these questions with others as to the relative value of various methods of treating coal cannot be discussed here. They are receiving ample attention at present in technical journals, for chemists and engineers realise that the days of cheap coal that can be burned without regard for such by-products as nitrogen, and inflammables are gone for ever.

The Staff.

As already mentioned, 24 retorts are in use, which are dealing with 130 tons of coal a day. It is intended to increase the quantity to 250 tons. Already a row of supplementary brick retorts is being added. These stand, of course, on the ground and are sealed below at the discharge valve by a water seal, i.e., the ashes are discharged under water. It is intended later to increase still further the size of the plant, when, doubtless, the problem of gas values will be considered.

As stated, the Mond interests are behind the company. The Earl of Selborne is chairman of the board.

The consulting chemist in London is Mr. A. G. Salamon, and the general manager in Natal is Mr. Robertson, who recently succeeded Mr. H. J. Ibbotson.

Mr. Robertson, like his alert and capable mine secretary, Mr. Kranz, is a South African, who qualified in chemistry at Capetown before spending some years in factory work in England.

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A PIONEER COKE VENTURE.

THE VRYHEID COMPANY—A BEGINNING.

There is only one coke-making company in South Africa, only one company that is that relies on coke alone for its revenue. This lone worker in a great field is the Vryheid Coke Company, Ltd. It started work in 1911. In that year a South African Commission reported on the Trade and Industries of South Africa and never mentioned coke: it discussed the coal trade and made recommendations about it, but the word "coke" does not occur.

The significance of this omission will be appreciated in civilised countries, where coke is the necessary fuel of the iron smelting industry. In the future electricity or gas may replace coke as a smelting agent; but whatever happens in the days to come, the making of coke in the days that are present necessarily precedes the making of iron. Before 1911 such coke as was used was imported, the impression being that the local coals would not "cake" or coke.

The Coke Pioneer.

Mr. J. H. Kelly, a North of England gentleman, who was in Northern Natal some ten years ago, knew something about coke making in his native county, and he constructed an experimental coke oven wherein he tested the coking qualities of half-a-hundredweight of Vryheid coal. The result was satisfactory, and the taking up of a small coal area situated in a hill three or four miles east of the village of Vryheid followed. The main requisite was freedom from sulphur, and the coal seam taken up gave an average, after a rough washing, of less than one per cent. of this bugbear of the coke maker who seeks a market among iron founders.

"Beehive" Coke.

A visit to the property to-day exhibits coke making reduced to its simplest elements. The coal seam, about 2ft. 9in. in thickness, crops out on the hillside some two or three hundred feet above the coke ovens. The coal is lowered by gravity to the foot of the washing plant, whence it is lifted after coarse crushing to the washing tables. Even this expenditure of power in raising the coal could have been avoided by running a gantry or staging out at the level required by the needs of the washing plant, and its accompanying drying tanks. The latter are placed high enough to allow the trucks to run along the top of the ovens for filling purposes.

Thus the power required is represented by the engine needed to raise less than 50 tons a day to a height of 15 or 20 feet. Part of this 50 tons is eliminated by washing out the impurities, such as a small percentage of pyrites, but the bulk of it goes to the coke ovens where the volatile matter is driven off by the slow combustion of the coal, with a carefully regulated quantity of air. In ordinary practice this burning reduces the quantity of coke produced to about two-thirds of the original weight of coal in the charge.

Some Figures.

The company possesses 34 beehive ovens, which produce about 750 tons a month, or about 20 tons each. If it is asked why a larger output is not produced the answer is that the market is too limited to allow of risky experiments. During the War the demand improved, but the following figures of the monthly returns of coke sold in the Union during the nine months of 1919 will explain much: January, 3,254 tons; February, 2,679; March, 2,123; April, 1,610; May, 1,895; June, 1,631; July, 1,478; August, 1,711; September, 1,387 tons.

Of this limited quantity the company sells more than its *pro rata* share. Other Natal coal companies produce coke to-day, but a reputation for high-quality coke has been so well-established by the Vryheid Coke Company that up to 1917 it secured from one-third to one-half of the total coke sales of the Union. The Government figures for the sales of the company during 1917 were 6,723 tons or nearly half of the total sales recorded. But in 1918 the War demands for coke raised the total output for South Africa to 33,833 tons of coke and this company's proportion was 7,062 tons.

The Quality of the Coke.

Coal miners elsewhere will be interested to read the following analysis of the coal mined by the company and of the coke produced. The analyses were made by Pattinson and Stead, of Middlesborough, England, in 1915:

Dried at 212 F.

	Per cent.
Fixed Carbon	66.00
Volatile Hydrocarbons	25.51
Sulphur	0.64
Ash	7.85
Phosphorus	0.003
Yield of Coke	74.4

Analysis of the Coke.

Carbon	88.71
Sulphur	0.74
Ash	10.55
Moisture in the coal as received	10.62

We add in this section the report of the same analysts upon the quality and value of the coal from this mine when compared with English coke. This evidence suffices to show that where the sulphur content is low Natal coals can produce good average coke suitable for iron smelting. Further investigation will be necessary before it can be said that the problem of obtaining a suitable fuel for iron furnaces in this country is solved, but the evidence of the report we publish is conclusive as to the value of the seam which is being worked by this particular company. The only drawback is that the acreage of coal is limited—though sufficient for the company's requirements for some years to come—and it has not yet been proved that the same quality can be obtained in the neighbourhood.

Another Pioneer.

No account, however brief, of the embryo stages of our coke industry can be complete if it omits reference to the pioneer work of Mr. C. A. O. Bain, of Johannesburg. He took up the business side of the venture at a time when the market was supplied entirely by imported coke and when the local product was thought to be inferior and costly to the experimenter. It is not easy to establish a business in the face of vested interests and against prejudice, but Mr. Bain, aided by the quality of the coke and the co-operation of Mr. Kelly, has succeeded in establishing the reputation of colonial coke against its oversea competitors. Mr. Kelly is the managing director at the mine, and Mr. Bain the business manager in Johannesburg. The company is a public one.

VRYHEID COKE VALUES.

A COMPARISON WITH EUROPEAN COKE.

Local makers of coke will be in a position to estimate the relative values of Natal coke from the Vryheid Coke Company and English coke, by studying the facts set out in the following report upon coal sent by the company to Messrs. Pattinson and Stead, whose laboratory is at 11 Queen's Terrace, Middlesborough, England. The report is dated 24th August, 1915, and gives useful comparative tables of coke values chosen from the best-known coking coals in Great Britain.

They write as follows:—

We have most carefully examined the sample of coal and coke received from you on August 14th, 1915, and have also for comparison examined samples of the best Durham Cupola Cokes. Furthermore, we have obtained the opinions of several cupola workmen as to what they thought of your coke as compared with the Durham cokes they were using, basing their judgment on the appearance only. These reports we give hereunder:—

1st Report.—This man said the sample submitted was not so dense and strong as the Brancepeth coke he was using, but was a fairly good coke. Brancepeth coke was brighter and apparently harder than the sample, and he preferred using the strongest coke he could get.

2nd Report.—This man, only 100 yards from the works where the man who gave the first report was working, said the sample was similar in character to the coke he was using, which was from Pelton Main in Northumberland. He had tried Brancepeth but got better results from Pelton Main.

3rd Report.—This man, in a large foundry, was using West Tees—a Durham coke. He said the sample was a good coke, not unlike West Tees. He liked a good hard dense coke. Pease's West and Brancepeth coke were, however, better than what he was using.

Our Report.—The sample, in our opinion, so far as appearance went, was a good foundry coke. It was strong and dense, close in texture, and when struck on a piece of metal, gave what is called a "potty" sound, similar to what earthenware pots give out when similarly struck. In our opinion, in physical properties it is about equal to average well-burnt Durham coke.

Density, Hardness and Porosity.—The density was determined by dividing the weight of water displaced when pieces of coke were completely immersed in water. The hardness was determined by cutting one inch cubes from pieces of coke, and finding the weight required to crush them. The porosity was estimated in terms of percentage of water the pieces of coke retained in their mass after immersion.

The results obtained were as follows, namely

	Specific Gravity	Weight required to crush a cube	Porosity
Vryheid Coke	0·93 to 1·01	2,800 to 6,600 lbs.	1·6 to 21 Average 7
Pelton Main Coke ...	91·29	7·90	0·81
West Tees Coke	0·99		6·00
Pease's West Coke ...	0·97		7·60%
Brancepeth Coke ...	1·12	3,300 lbs.	4·00%
Auckland Park Coke ...	1·09		9·80%

ANALYSES.

	Carbon	Ash	Sulphur
Vryheid Coke	88·45%	10·82	0·72
Pelton Main Coke ...	91·29	7·90%	0·81%
West Tees Coke ...	91·29	5·07	0·64
Pease's West Coke ...	92·24%	6·90	0·86
Brancepeth Coke ..	92·24	5·75	1·01
Auckland Park Coke...	88·98%	9·95%	1·07%

The Durham cokes vary considerably in sulphur and ash, from 0·60% to 1·0% sulphur, and from 6% to 10% ash.

CONCLUSIONS.

The Vryheid coke compares favourably with the Durham cokes in specific gravity and porosity, but it is harder and contains more ash. Hardness is always considered an advantage in coke required for foundry cupolas, provided it is not too dense, and Vryheid is not so heavy as some of the best Durham coke. One foundry authority maintains that the coke suitable for melting iron should float on water, and nine out of ten pieces of Vryheid coke did float on water.

The ash is rather higher than in Durham coke, but the only disadvantage in this is that a little more Vryheid coke than of the best Durham coke must be used in smelting. Excluding Auckland Park, which is more frequently used in blast furnaces than in cupolas, it would take about 5% more Vryheid coke than of average Durham coke; that is to say, if it took 3 hundredweights average best Durham coke to melt a ton of pig iron, it should take about 3·15 hundredweights of Vryheid coke to do the same work.

By floating the sample of coal you sent on a solution of calcium chloride to specific gravity—1·40—about 6% shale sank to the bottom, and this contained 20% ash. By calculation this means that theoretically perfect washing would enable you to make coke with 9·5% ash.

More perfect washing of the coal is the only manner in which you could improve the coke.

In a further letter on the same subject the same firm of experts amplified the above report with statements which are more definite as to the comparative values of English and Vryheid coke. They report as follows:—

In our report of the 24th August, 1915, we stated: "More perfect washing is the only manner in which you could improve the coke."

We answered the question on page 2 of your letter of the 2nd June, 1915, re lightness and porosity by practically proving that in these respects Vryheid coke is identical with best Durham foundry coke, the very coke with which you have to compete, and with which users compare it.

The large amount of ash is responsible for the more dirty working in cupolas.

The extra hardness of your coke we considered to be an advantage, for with good strong blast the harder the coke the more fierce the heat in the combustion zone. If the coke were inferior in this respect it might be better for works where the blast was feeble and the plant in poor condition, but if you were to make it softer it would not be so suitable for places where the conditions were good. You are, therefore, "between the devil and the deep sea."

Perhaps you might send softer coke where soft coke is required, and hard coke to other places.

Some portions of your coke were softer than others, a proof that you can make soft material. If you were to lower the temperature of coking you might get an inferior and softer coke which would meet the requirements of those who have inferior plants.

We showed that a little more ash than is present in Durham coke would necessitate using a little more coke, and this, of course, with a given blast pressure would take a little longer to burn in the cupola.

We doubt whether you could materially decrease the ash by more efficient washing.

The fact that where the coke is substituted for Durham without the knowledge of the workmen and that no complaints are made, justifies the conclusion that complaints from other works are due to prejudice only or mainly.

OIL IN COAL AND IN COAL SHALE.

The statement is made by experts that North America's reserves of mineral oil will be exhausted by 1950. No fields can long hold out against the immense drain of oil demanded by modern transport and industrial machines. It is said that oil-driven war ships are the ships of the future; but the present position is that the oil fields of the world cannot, unless greatly reinforced by new discoveries, supply the motor spirit and other oils called for.

South African Oil Shale.

Attention is accordingly turning to the oil contained in coal and in coaly shales. The latter exist in great quantity in various parts of the world—with North America leading as usual. The States claim billions of barrels of oil as the probable yield of their oil shales. England has also made some valuable discoveries of oil shale lately, particularly in Norfolk, where a great oil shale industry will soon be in full movement. Shales containing payable quantities of oil are being explored in various parts of Europe also.

And in South Africa the recent discoveries on the eastern borders of the Transvaal of coaly shales containing oil promise to aid considerably in supplying the needs of this country for motor spirit. The discovery is recent and the limits of the new field have not been defined at all; it is probable that oil will be found in similar shales in other parts of the Transvaal. Steps have been taken to supply the needed money for the testing and extraction of the oil contained in these shales; the quantity contained in them is said to be from 25 to 30 gallons per ton, a figure much above that recorded of the oil shales of Scotland. It should be noted that the British Government has recently lent the Anglo-Persian Oil Company two millions of public money, and of this amount one million will be used to prospect for and develop oil in the Scottish shales.

Mr. R. A. Rouillard,

Managing Director, Enyati Colliery.

Oil in Coal.

But apart from the oil in shale there is the oil in coal. All coal with volatile constituents contains oil of various densities. By proper processes of distillation in by-product ovens or from tar the light motor spirit can be separated from the heavier oil in coal. Considering the enormous quantities of coal mined, amounting in the States alone to 500 million tons yearly and in Britain to nearly 300 million tons, it is apparent that by the use of scientific processes very large quantities of oil can be produced from coal. An average of 10 gallons of oil from each ton of coal mined would yield from the coal outputs of North America and Britain alone 8,000 million gallons of oil, of various values.

We have no space to deal with this subject, but everyone interested in the development of industry knows that no more important question is occupying attention, excepting only the hidden values in coal itself and their economic utilisation. It is therefore a matter of public import and should be examined by the Government as a part of the subject of coal values.

There are many other phases of this subject that call for attention and the only sane method of dealing with it is for the Government to appoint a commission of scientific and business men to take evidence regarding it.

ADDENDA.

The name of the Portuguese Director of Railways is incorrectly given under his photograph appearing on page 121. The Director is Senhor A. B. de N. Oliveira é Andrade.

* * * *

The maps and section of the Natal coal fields, illustrative of Mr. F. A. Steart's paper on the subject, are reproduced in this number by the kind permission of Mr. Jago, the secretary of the Geological Society.

* * * *

The name "Imgach Island," printed below the block on page 17, should be Inyack Island. On page 154 the title should read, Mounstephen's.

* * * *

The agents of the Enyati Colliery are Stafford Mayer and Co., Ltd., at Port Louis, Mauritius, and at Durban, Natal. The agents in London are J. T. Rennie & Sons, and at Johannesburg the General Coal Agency.

* * * *

The Transvaal and Natal Collieries, Ltd. (recently Uitkyk Colliery), have proved three seams of best quality coal on their new purchase of 400 acres near Vryheid, Natal. The London agents are Messrs. W. H. Bowater, Ltd., of 14, Billiter Street, London, E.C.

* * * *

Mr. I. Hatton is the manager at Hlobane Colliery (Vryheid Coal and Iron Co.). His assistant in the office is Mr. J. S. Wynn. At the Durban office is Mr. W. Bosman. The general manager of the company in South Africa is Mr. J. M. Calderwood, whose address is P.O. Box 2296, Johannesburg.

* * * *

The fill-up paragraphs in this issue relating to coal are taken with acknowledgments from the *Colliery Guardian*, and the *Iron and Coal Trades Review*.

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THE TRANSPORT OF COAL

RAILWAYS AND SHIPPING

Some Proposed Improvements

JAMES WATT, whose centenary was celebrated a few weeks ago, made modern industry possible. In essence his great invention of the steam engine was a contrivance to convert the heat of coal into power by using the expansive force of gaseous water as the intermediary. Coal became man's servant; and Stephenson's later development of coal force to steam engines running on rails brought this servant to the doors of every man or group of men who desired to work. Without Watt's steam engine and Stephenson's iron road no industry such as we know it to-day was possible.

We forget these truisms too often. In South Africa, like everywhere else, rail ways are the necessary antecedent of all industrial developments and groupings. Slowly over a period of 40 years the railways have extended over the veld, and till they did so extend no coal could be carried, no steam could be generated, and no considerable towns were possible.

And as things are to-day only the merest beginnings of a larger society are visible. There is only one considerable town, a town which is built up on the world's assumed need for gold, a metal used in the world's exchanges. Whether the demand will continue, or whether the conditions of the post-War world will continue to allow gold winning to be possible, no one can say. And it does not appear that anyone cares. The dilatory rulers of the country pin their faith in the future to the farmer—of whom there is about one to the square mile of South Africa.

SOUTH AFRICA'S USE OF COAL.

So far as coal then is concerned, when one has given the coal consumption of the gold mines about Johannesburg the task of summing up South Africa's industrial position is nearly complete. For the rest some coal is being sent away to more industrious and more developed countries than this "Dominion." Every effort is being made to encourage a trade in selling coal to other people. Excluding mining and this exotic and exhausting new business of export, the figures of the coal movements of the country are as illuminating as a lightning flash. Here they are for 1917, when shipping was fairly plentiful. The total for 1918 is about the same.

The total tonnage (2,000 lbs.) of coal produced in the Union of South Africa was 10,383,000, showing an increase of 375,000 tons over 1916. The Transvaal mines produced 6,641,000 tons of this quantity, Natal produced 2,890,000 tons, and the Orange Free State 843,000 tons. The output from the Cape Province was only 8,000 tons.

And the main lines of consumption were: In the mines 2,536,000, and in shipping 2,886,000 tons. Total consumption in mines and shipping combined, 5,422,000 tons.

If we deduct these mining and export quantities we get the following figures:—

	Tons
Total coal produced	10,383,000
Mining and shipping consumption	5,422,000
Balance (representing domestic and industrial consumption of Union) ...	4,961,000

There is no other fuel to speak of in South Africa, and we thus reach the conclusion that this Dominion of seven million persons is using in [illegible] and factories and on its railways and [illegible] less than five million tons of fuel. In the United States, which are not much older, the yearly output is [illegible] tons. New York uses twenty million tons.

We have much leeway to [illegible] before there can be any talk of "greatness," and it will be well if we approach our problems of coal utilisation, [illegible] and expansion of industry in a humbler spirit. Indeed the question arises whether the policy of promoting a great export trade is not radically wrong in so far as it draws energy and enterprise away from the internal needs of the country. Is England's coal export an evil?

Such questions arise at the threshold of any inquiry into the railway resources of the Union and of their adequacy to meet the needs of an expanding life. So far as the coal miners are interested they would probably vote for internal development rather than for a great export business. The standard of the latter is very exacting, and as we shall see later, requires a close selection of the best coals and a corresponding loss in the locking up of large reserves of lower grades of coal, that are quite good enough for local demands.

STATE-OWNED RAILWAYS.

It is necessary to explain that the Governments of South Africa own the railways, the three States concerned being the Union of South Africa, Portugal and Rhodesia. Political and traffic considerations have practically isolated Rhodesia from her neighbours, and the coal problems of that Colony do not come into this review, as her internal market is extremely limited and there is no export outwards of Rhodesian coal to the ports of her larger and more advanced coastal neighbours. The coalfield at Wankie between Bulawayo and the Victoria Falls has remained till now undeveloped except for the small internal needs of Rhodesia. Since the close of the War, however, the Wankie district has had some attention paid to its possibilities, and a number of ovens for the production of coke and certain coal by-products are under erection.

And of the remaining two railway systems only that of the Union need be dealt with in any detail. The Portuguese railways are important because they link the Union railways with the sea at Delagoa Bay, a vital sea outlet for much of the Union hinterland. The length of the Portuguese lines is, however, very limited, the Portuguese section of the present Johannesburg-Delagoa railway being only some 50 or 60 miles in length, while the section to Swaziland is at present useless, as we explain in our later notes on the subject of Delagoa Bay and Portuguese relations to the coal traffic of the Union.

But before dealing with the subject of Union coal and Union railways it was desirable in view of the strong criticism of the railway administration current in coal circles to ascertain what the case of the railways is and how far the new conditions following the close of the War have modified the present and future policy of the Government. Accordingly an interview was sought with Sir Wm. Hoy, the General Manager of the Union Railways. He kindly deputed the principal operating official to give us some views from the railway side.

RAILWAY IMPROVEMENTS.

The first point dealt with was the improvements proposed to be carried out on the Transvaal railways. It is intended to lay out a big marshalling yard at Kendal on the line between the East Rand and Witbank on the Delagoa Bay railway. Kendal is a station that is near the western edge of the Witbank, a main Transvaal coalfield, and is practically the terminal point of the western coalfields. The coal traffic of the Middelburg district will be gathered at Kendal, the idea being to amalgamate the coal traffic and to [illegible] 1,200 tons [illegible]. All the coal east of Kendal will be forwarded into the marshalling yard, sorted and made up into these block trains. In that way, instead of accumulating the coal at the individual colliery stations, the coal is collected at one central

SOUTH AFRICAN RAILWAYS AND HARBOURS.

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point, thereby allowing the railways to secure larger train loads, which will be made up for particular stations or districts. The advantage is that that train does not need to be broken up or remarshalled *en route*. Once made up, it can proceed to the furthest point with the least possible delay and without interfering with work in progress at other yards on the line. This will secure the bunker coal trade through to Capetown, the industrial coal for the mines, and coal for railways and locomotives. If the lines are electrified these big trains can be made up to 1,500 or 1,800 tons each.

New Rand Railway.

The next matter dealt with is the proposed new railway from Apex on the East Rand to a point in the vicinity of Potchefstroom. This is to be built to ease the traffic along the present Rand lines. It will be a fairly long line, but actually six miles shorter than the existing route along the mines. It has the advantage, too, of a lesser gradient of 1 in 100 against a ruling gradient of 1 in 76 on the present line. A load of at least 1,350 tons on the whole section can be got through to Klerksdorp instead of, as at present, breaking up the loads from 1,350 to 1,000 tons and subsequently to 900 tons, and then rebuilding them back again to 1,000 tons. It will not run along the Main Reef mines but more to the south and join up at Natal Spruit or thereabouts. At present this plan is only in its initial stages and has not received Railway Board or Parliamentary sanction.

Better Railway to Delagoa.

Following up the subject of the proposed improvements on Transvaal railways designed to better the coal trade, it was explained by the operating officer that already much had been done to improve the main line between the Transvaal coalfields and Delagoa Bay, and it is now possible to take a thousand tons of coal right through to Delagoa Bay in one load. This applies to any kind of traffic, but coal is the chief load. The improvement of the administration's engine power will allow the Delagoa line to take in the near future at least double the quantity of traffic taken at present.

Further, if the export of cargo and bunker coal through Delagoa Bay increases, it is likely that a deviation will be taken in hand between the Oliphants river and Middelburg with a view to increasing the loads between Witbank and Belfast. Such a deviation will start somewhere near Oliphants River bridge and rejoin the main line on the other side of Middelburg towards Pan.

Coal Owners' Disputes.

At present, it was explained, the train loads were only 600 tons gross, say 400 tons of coal. The railway could do 5,000 tons of coal to Delagoa Bay daily at a push, but the average had been about 4,000 tons from the Witbank-Middelburg area. As regards the coal mines on the south-east or Swaziland side, not much had been done to increase the traffic except that 80 lb. rails had been put down on the section between Machadodorp and Breyten in readiness for any development of the coal in that area. There are smaller mine owners on that side, and owing to the absence of combination it is sometimes difficult to meet the variable demands for trucks. The Association of Coal Owners objects to a small colliery getting trucks for, say, 1,000 tons to fill a shipping contract on the ground that this quantity is disproportionate and in excess of the colliery's *pro rata* share of the trucks. "If," continued the officer, "the smaller collieries were to amalgamate on similar lines to the Transvaal Coal Owners' Association it would be easier for them and would at the same time improve the conditions in the Ermelo-Breyten district. Put it this way. We will say that Breyten is asked to do 1,000 tons [illegible] certain ship. To do that and to avoid delay to trucks, there must be 900 or 1,000 tons per day to get the ship away, or the company is mulcted in demurrage. Now, if a number of collieries associated, they could do this 900 on a [illegible] basis of 200 or 250 tons each."

Transvaal and Natal Coal.

It followed that for this and [illegible] the Ermelo-Breyten coal area had not been [illegible] extensively as the Witbank district. Heat value [illegible] nothing to do with it. The railways work on the [illegible] the test when dealing with coal and pay [illegible] the [illegible]tory calorific tests. The Transvaal coal runs from 6·28 lbs. to 7·75 lbs. of water evaporated per pound of coal. The Natal coal is the best according to these tests. Otherwise the standard is 12,500 British thermal units as calculated by calorimeter, or what is known locally as 12·5. Referring to the South Rand coalfield, this is not used on the railway. The bulk of the railway needs taken from the Transvaal coalfields came from the Middelburg or Witbank group of mines. The extension of the railway south of the Breyten district does not at present bring any coal to speak of to the Delagoa Bay outlet. In the district about Piet Retief coal mines have not been fully developed. The railway grades between the Natal fields about Vryheid and Piet Retief are heavy, and as the coal traffic is rapidly increasing it is proposed to relay this portion of the line with heavier material. Coal traffic from the Breyten-Ermelo district is devoted principally to railway and industrial purposes, but any for shipment is railed to the coast via Machadodorp to Delagoa Bay. The Natal mines about Vryheid have the best coal. The Transvaal average was about "12·5 calorific" and coal which did not reach this standard was penalised. About Vryheid and other Natal districts the collieries gave as a whole somewhat higher heat values, but the coal is more friable and breaks up more easily than the Transvaal coals which are harder. Some of the Natal coals were liable to take fire and care had to be exercised. As a rule the Natal companies have not bothered in the past about making use of their "smalls," as they have had a big market for their "large" coal, and bigger markets than could be supplied. But some of the Natal mines have latterly increased their equipment, and as the industrial business of the country increases they will find a market for their nuts, peas and duff, as the various grades are named. Natal peas and nuts come even to the Transvaal mines; and power plants and engineering yards that can use "smalls" are now using them freely.

The Value of Coal.

But Natal coal works out at about 50 per cent. large and 50 per cent. small coal—this is because it is more friable; of the smalls not more than 12½ or 15 per cent. is utilised; therefore it may be said that about 37 per cent. of the coal taken out is at present a waste product. It could be turned into briquettes and utilised for by-products with advantage.

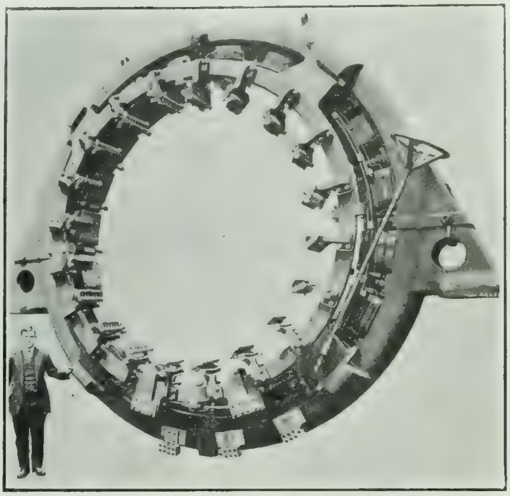
"What this loss amounts to will be realised," said the officer, "if I quote from an address delivered by Mr. Ross, formerly Chief Engineer of the Great Northern Railways in England. Mr. Ross stated that the gas works in Great Britain carbonised about sixteen million tons of coal, yielding about 188 thousand million cubic feet of gas, eight million tons of coke, and 480 million gallons of ammoniated liquor which is converted into sulphate of ammonia, and used as fertiliser, and the gas works yield in addition per annum 160 million gallons of coal tar, and from that coal tar again you can produce creosote, pitch, napthaline, carbolic acids, disinfectants, antiseptics, aniline dyes, picric acid, and certain other things which are explosives. That is what they get from 16 million tons of coal, a wonderful quantity. Are we wise then in exporting so much of our coal? Or, again, are we wise in wasting so much of our coal when we have mined it? Mr. Ross went on to say that there is a consensus of opinion that the maintenance of a large coal export trade is essential to the prosperity of the coal-producing districts, contributing as it does to the continuous regularity of work and thereby keeping down cost. He says that coal is so essential an element of outward cargoes that if reduced it would inevitably cause a rise in the import freight of goods. And then he goes on to argue that it is very doubtful that Great Britain should export the amount of coal she has done in the past."

Railway Improvements in Natal

Referring to the Cape coal mines about Molteno, the officer said the railway did not take coal from them, as the quality was very low. The evaporation test on the railway for that coal was about 4 lbs. of steam to one of coal. The main coalfields of South Africa were those of the [illegible] and Natal.

Natal Railway Improvements.

As regards improved railway facilities in Natal, much had been done during the last six or seven years. "There is the



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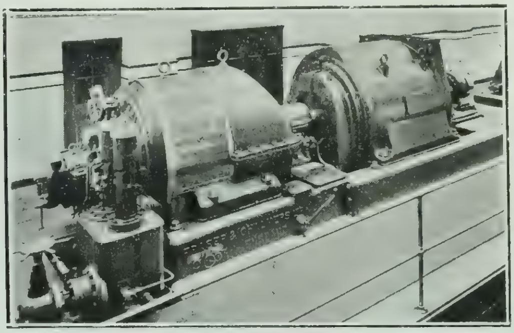

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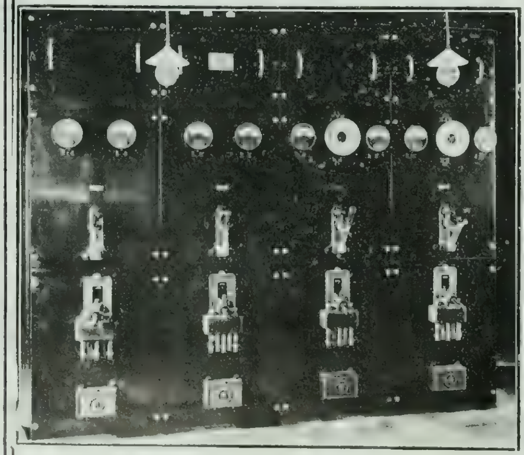

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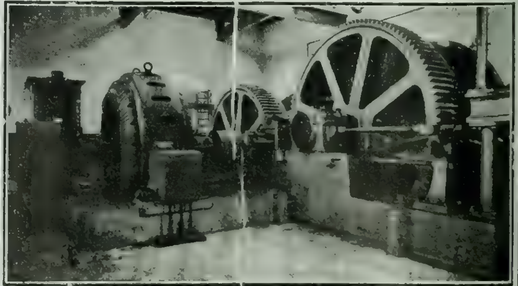

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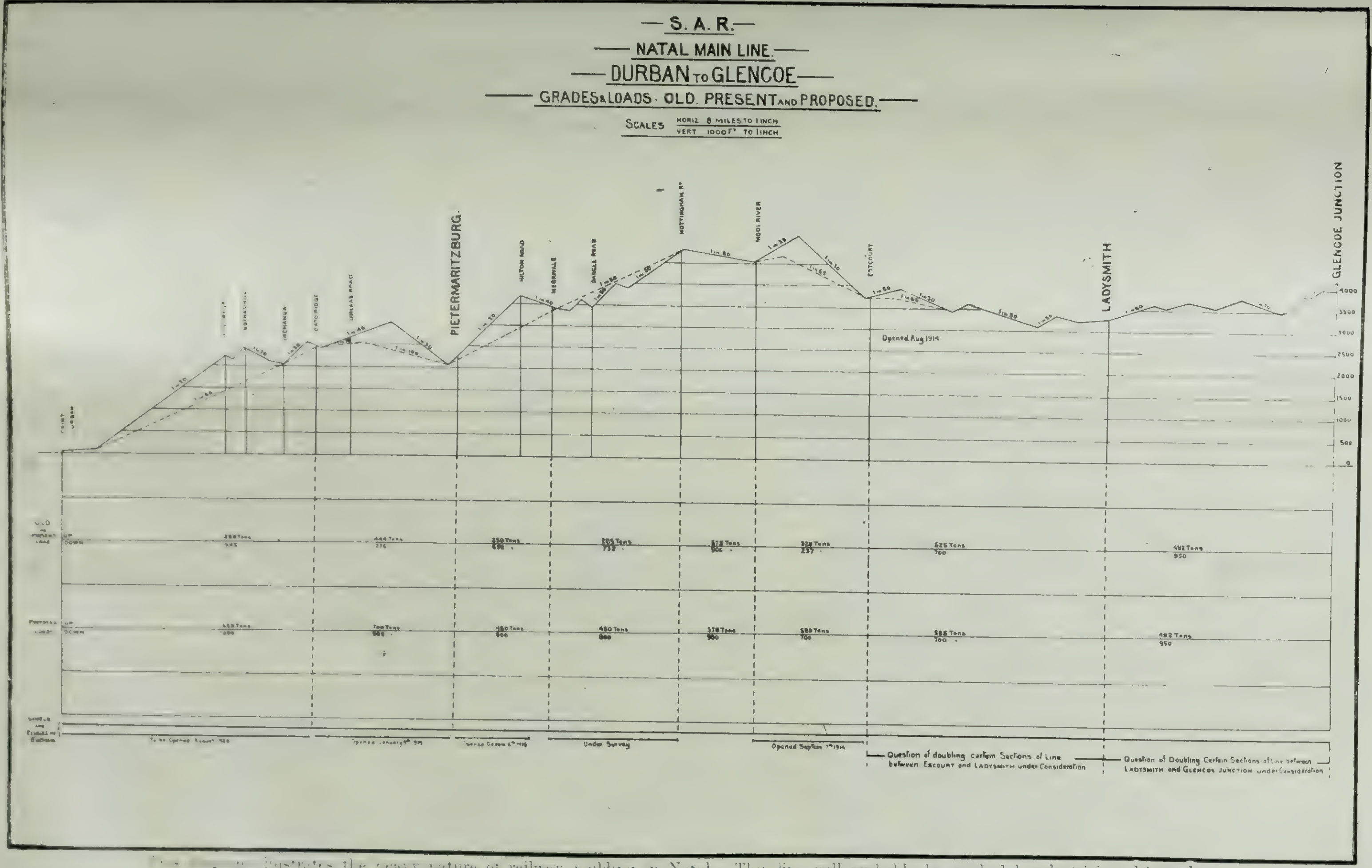


This diagram illustrates the heavy nature of railway building in Natal. This line will probably be worked by electricity ultimately.

be yard a mile and a half north of Ladysmith for making up trains for the Point and the Bluff. And then the Maritzburg yard has been re-modelled and a lot of sidings has been put in there. Also there is a new deviation between Estcourt and Mooi River, between Cedara and Maritzburg, and Maritzburg and Umlaas Road—all opened within the last three or four years. Then we have the biggest deviation in the country between Cato Ridge and Clairwood in the course of construction and after that is completed it will increase the hauling capacity between Durban and Maritzburg by 50 to 70 per cent.

"This deviation is extensive; there are six tunnels and the embankments entail very heavy work. Some years ago one of the burning questions in Natal was whether the whole line should be doubled or whether they should have an alternative line to the port. It was decided to improve the present main line rather than take either of the other two courses, so it might now be said we shall have brought the Natal main line up to a good standard by the end of next year. It is thought that when this is completed the Natal main line will have improved as far as the carriage of coal and general goods is concerned by about 45 per cent. on its present average. The contrast between 75 per cent. on the southern section and 45 per cent. for the whole line is due to the fact that the heaviest gradients and curves are to-day south of Cato Ridge. There you have one in thirty grades, 300 feet curves, and so on. If you improve that line by 75 per cent. it does not mean that you have increased the whole line from the coalfields to the Point by so much. The big coal mines in Natal in the Hatting district from Wallsend to Newcastle have been in existence for twenty-five years. Some of them have or are giving out, and the prospect of opening up new mines on the main line are not so good as a few years ago. But the future prospects of the Vryheid district are very good."

The Railways and Shipping Needs.

Dealing next with shipping problems, the railways have found from experience that the harbour coal bin which holds 10,000 tons has made a big difference. It facilitates the release of trucks and so increases both the earning capacity of the trucks and the output of the mines. There is a limit to the number of trucks that can be put on a single line of rail. A system has been adopted during the War in Durban of ground-stacking—that is that every colliery had a ground stack for its coal. This was a good system provided that we had appliances to lift the coal. To dump that coal by hand, reload it again by hand into trucks, and ultimately get the coal into the ship meant several handlings and much cost. It gets broken up as well. But if you can dump on the ground and lift it up by means of grabs or other appliances, and put it direct into the belt-conveyor, or in some other mechanical way get it direct to the ship, then it is quite a sound idea. It is understood that they have an arrangement of that sort at Aden and again in the Suez.

With regard to the business arrangements, or absence of arrangements, between the Natal coal owners, it is stated: "We, the railways, suffer in Natal from the absence of proper grading and pooling arrangements between the mines. The older collieries have built up big businesses by their connections with shipping companies, and so forth, and having first grade coal they naturally feel that they should not share their good fortune with less fortunate collieries, who perhaps have inferior coal. The result is that the business is not properly allocated to the various collieries. This in turn means that the railways have the utmost difficulty in allocating the truckage to meet the requirements of the respective mines. Each mine declares its output capacity, and very often these capacities are exaggerated with a view to overcoming the truck shortages which occur from time to time. If they had an Association on the lines of the Transvaal Association or some similar lines it would be possible for them to agree amongst themselves as to the allocation of business, and following the allocation of business they would get an allocation of truckage which would simplify our working very much. In the first place if there was not a full truck supply to meet everybody's demand, they would all get their *pro rata* share, and the present jealousies would disappear. Then, too, the buyers would always be assured of having the class of coal required, such say, two grades for shipment: other grades of coal would be set aside for private and industrial purposes, so in that way it would enhance the value of the coalfields in Natal from the public as well as the individual point of view. Assuming, for instance, that the first grade coal was 14 or 13.5 calorific, and the second grade coal was 13, the relative prices of the two might justify some shipping companies in purchasing the second grade coal as against the first. From the collieries and railways' point of view, it simplifies enormously the shunting at the Point or the Bluff. The coal would be accumulated at the new junction proposed to be created at Clairwood, to be known as Booth Junction, on the South Coast line, and when the coal gets to the Bluff there would be only two grades, and the individual colliery's coal would disappear. Twelve or thirteen Natal collieries want their own coal in their own trucks so as to supply each shipping contract. For example, if a ship comes in belonging to the Holt Line and has contracted with one colliery and there is not sufficient coal on hand belonging to that colliery at the time it might mean that the ship has to remain there until the coal is received. But if that colliery were in friendly agreement with another colliery, or better still with several collieries, and the coal was of equal quality, then coal would be exchanged. But this happens now only when it suits the collieries, with the result that the ships are delayed."

The Railways Suggest Reforms.

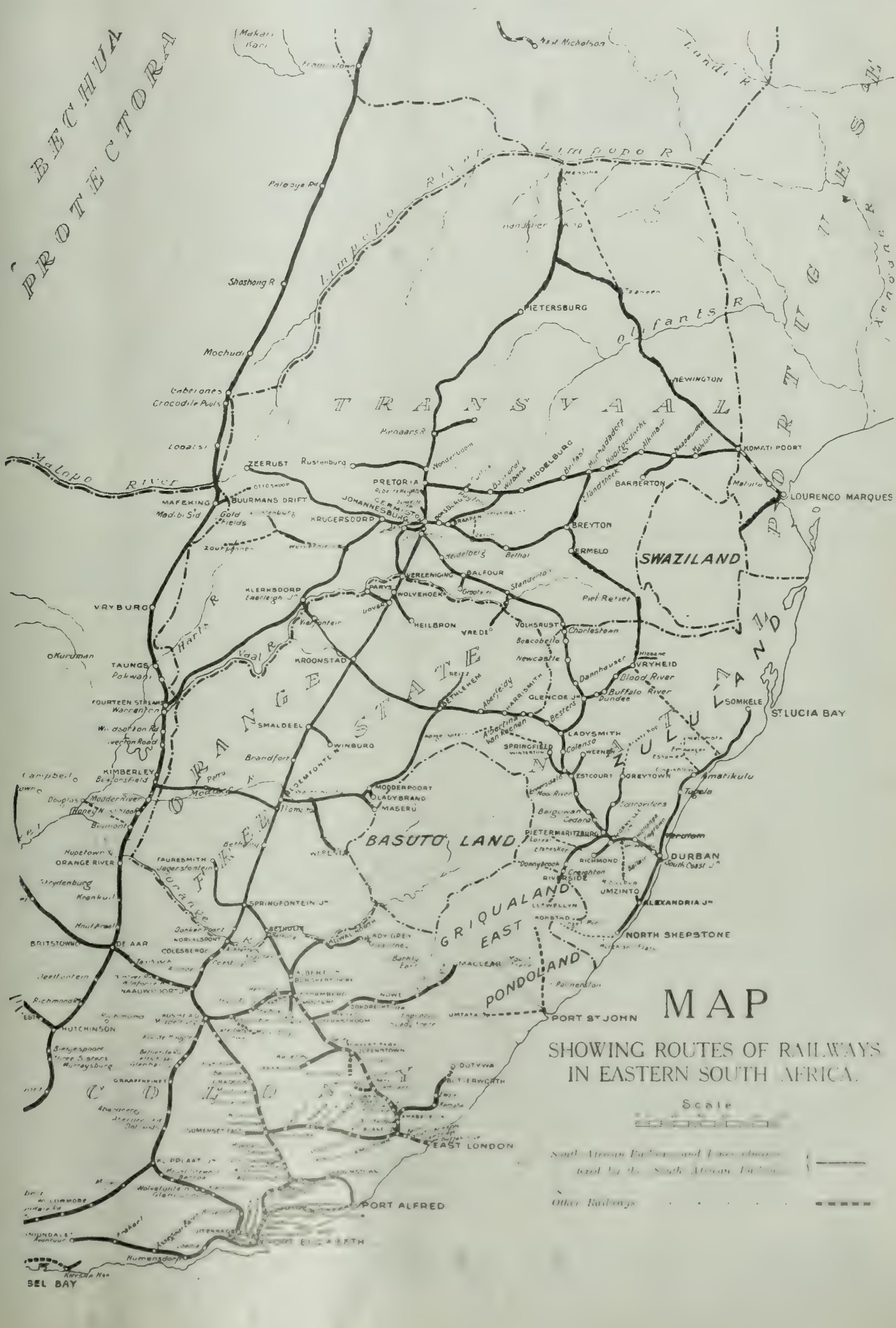
The railways would like to see the collieries agree among themselves that they will grade their coal. The railways are not experts as to coal qualities. But the advice they offer is: "Choose your own expert. Grade your coal. Agree amongst yourselves. Let it be for a definite period and see what the results are." The consequence is that if Durban is congested and ships are diverted to Delagoa Bay, the railways are able to transport coal to Delagoa Bay and get the ships away without delay. The reason is obvious. At Delagoa Bay they work under quite different conditions. There, some eight or nine collieries combine and send their coal down to Delagoa Bay, and the ships are easily supplied.

But in Natal, our informant said, it is different. Each company enters into its own contracts and makes itself responsible for those contracts. They have an interchange arrangement among themselves, but it is only applied when it suits themselves. When the ship leaves South Africa and the skipper or engineer is asked what coal they have taken they say they have taken Natal coal. They do not say that they have taken coal from a particular Natal mine. They do not know it. It is Natal coal. What difference does it make? There may be a monetary loss to start with, but if by agreement can be built up a bigger business the losses they sustain at the commencement will soon evaporate, and it must be an advantage in the end.

Improvements Promised.

Generally on the subject of the improvements to be carried out the officer said that facilities could be increased to the different ports. It is not conjectured, however, that the Railways can double the output from any port, say, within six months. Shipping is an uncertain factor. Ships may arrive in numbers at a port and at other times there are lulls; no organisation in the world can combat the irregular running of ships. If there was a storage of 100,000 or 200,000 tons of coal at the port and through stress of weather or by non-arrival of ships the shipments were delayed, some of the coal would deteriorate. But there should be a reasonable reserve, say, of at least 50,000 tons at the ports, especially at Durban, because it is essentially a bunker port and the coal is for bunker purposes mainly. Transvaal coal is, however, cheaper and cargoes of coal for export are sent through Delagoa Bay. Each port, however, has each class of business and this distinction between bunker and cargo coals is only a rough one.

In conclusion we were assured that the Railways would do all that is required to meet any increased demand for coal at the ports, and any drawbacks affecting the export trade would not be due to the Union Railways.



MAP

SHOWING ROUTES OF RAILWAYS IN EASTERN SOUTH AFRICA.

COAL TRANSPORT

THE CLAIMS OF DELAGOA BAY

The statement regarding railways that we have given in the preceding pages on the authority of a responsible Union railway official, does not exhaust the list of projected improvements in progress or to be put in hand on the State railways of the Union. But it discloses the main decisions taken regarding the future railway needs of the country so far as these affect the coal trade, and coal owners can take the statement as declaratory of the improvements to be carried out in the near future. The proposed electrification of certain Union railways is referred to elsewhere.

The Railway Programme.

Whether those interested in the coal industry will consider the programme liberal and progressive is questionable. We shall look at this contingency presently. Meanwhile as there are other railway administrations in South Africa, a reference to their railways and railway policies is necessary before any estimate can be made of the possibilities and prospects of a large export coal trade from South Africa.

For it appears from this outline of the Union's railway programme that the improvements to be made on the Natal railway, which is the only carrier of Natal's coal—and of much else—will amount to about 40 per cent. increase over the existing capacity of the line. This does not seem adequate if a large export trade in coal is to be created, as members of the Government assert. A 40 per cent. increase in the present limited values of Natal's coal exports would not be worth talking about, and certainly not worth writing about. We must get to larger conceptions of the whole problem.

Rhodesia's Position.

But first what of Rhodesia, whose outlet is at the Portuguese port of Beira, a little south of the mouth of the Zambesi River? And what, too, of Delagoa Bay, the Portuguese port of the Transvaal coal mines? Can South Africa, and especially her southern areas that are included in the Union of South Africa, find the needed railway outlets through Beira and Delagoa Bay, seeing that Durban, the Natal port, cannot promise anything better than a limited expansion?

Rhodesia, as we have already said, lies too far north at present, and her single coal company lies too far inland to allow of hopes of Beira. The coal from Wankie Colliery south of the Victoria Falls must now zigzag painfully along tracks limited as to solidity and carrying capacity, first coming south to one junction, then far to the north-east to another, before turning definitely eastwards to the coaling port. And, of course, there is no sense in sending Union coal on still longer journeys to the Beira outlet, even if the coal in Northern Transvaal were developed and a railway connection made between the Transvaal and Rhodesian systems.

But Rhodesian coal could be brought into the competing circle if the political and territorial tinpots were kicked decisively out of the way. In the railway map we publish, readers will see that only a short distance must be bridged to connect if the Northern Transvaal railway, now stuck in the air at Messina, on the Transvaal boundary, were linked up to West Nicholson in Southern Rhodesia. Such a linking line would at once give Rhodesia, and especially, so far as our subject is concerned, Wankie coal an outlet to Delagoa Bay, the Transvaal coal port. Wankie coal could then, if of special quality, be sent via West Nicholson and Messina down south-east through the Transvaal to the junction at Komatipoort and so on to Lourenco Marques. But the distance is long, and only the more expensive by-products from Wankie are ever likely to enter into competition, for, let us say, the Asiatic trade.

Portuguese Railway Problems.

Rhodesia may therefore be blotted out of the plans; she is still a backblock number. Only Delagoa Bay is left. And here we touch a major factor of the coal development problems of South Africa.

Delagoa attained to the dignity of a "problem" long ago. Conceive the rapid and prosperous growth of a rich hinterland belonging to one people, and the corresponding reactions so evolved on the position and progress of a foreign province so placed as to command geographically the seaward outlets of the growing hinterland. The Transvaal, whose gold mines lie inland, is now desirous of developing her coal deposits. As the railway map is now drawn, this trade must go through Delagoa Bay. But if this is done conferences and agreements and trade adjustments must precede the plans to create new markets. Such conferences and adjustments are necessary to-day.

The story of Delagoa Bay's relations—economic of course—is a long one. We will not tell it. Qualified Portuguese gentlemen have courteously agreed to write something of the Portuguese case, and their statements will be found elsewhere in the section dealing with the capabilities of Delagoa Bay as a coal outlet; they also suggest that there are other considerations that greatly affect any proposals to come to terms with their hinterland neighbours. What they hint at or state but briefly and with restraint we shall handle less tenderly.

The Labour Agreement.

Labour for the gold mines is the leading element in these unquiet land and sea relationships. Portuguese labour has been the main standby of the gold mines for a generation past. And the need of the mines for Portuguese native miners dictated the commercial agreements. In 1909, when the Union of the South African States was affected, a labour treaty was signed giving Delagoa Bay 55 per cent. of the sea trade with the Transvaal industrial centres. In return the mines got Portuguese labour.

That agreement expired early this year, and now continues only at the will of the two signatories, either of whom can denounce it on giving one year's notice dating from April. The question is, Will either of the parties denounce the Mozambique Convention—for so it is locally called—in the coming April?

Punic Faith.

The answer to this question is that denouncement is not probable. But equally it is not very improbable. Nothing would happen for a year. And Portugal, represented in this by Delagoa Bay opinion, is demanding that something shall happen; that her present situation is intolerable because the treaty has not been kept and that the Union of South Africa does not keep agreements. It is in this last idea that danger lies. The argument runs in this way: Why should we sign new agreements when we must conclude from past evidence that even signatures do not bind the South African Government—much less verbal promises.

A "Serious" Statement.

Stated with bluntness this, in common parlance, is a "serious" statement. But nothing is serious nowadays except the seizure of the "oof"; and in this case it is the Union Government that has secured the elusive bird, leaving the Portuguese vainly whistling against the wind. So the Mozambique Convention as regards the 55 per cent., which is the Portuguese share, is a fraud. This is present Portuguese belief, and the belief may lead to action—that is to the cancellation of the Convention.

And there is another matter that rankles and may influence action. It is known as the Swaziland railway question—another case of broken faith. To make the whole subject of these hinterland railways and coast harbours clearer we shall give a few details of each of these vexed matters.

LOURENCO MARQUES

Is the CHIEF SEAPORT and CAPITAL

of PORTUGUESE EAST AFRICA

ONLY TWENTY HOURS TO JOHANNESBURG

CONNECTED by Railway with Johannesburg and all parts of the Union of South Africa. Passengers for Transvaal Towns and Goldfields step from the liner at the quayside at Lourenco Marques into modern well-equipped trains supplied with sleeping and dining cars, and every convenience

LOURENCO MARQUES is the SEA GATE of South Africa's RICHEST Province, It is the Coaling Harbour of the Transvaal and the nearest South African Coaling Port to East Africa, Suez, Aden, Mesopotamia, India, Ceylon. Lourenco Marques is the nearest South African Port to East Africa, Egypt, Arabia, Mesopotamia, India, Ceylon, Singapore, the East Indies and China.

IT IS THE COALING HARBOUR of the Transvaal Coalfields, supplying hard high-grade Transvaal Shipping Coals at prices that are below those of any other South African Coaling Port.

Vessels save time by Coaling at Lourenco Marques where the loading appliances are equal :: :: to any in the world :: ::
Operated Throughout by Electricity.

DELAGOA BAY is 22 miles broad and 26 miles long and offers BOATING and YACHTING SPORTSMEN the FINEST REACHES of SMOOTH WATER in AFRICA. SPLENDID BATHING.

FOR TRAVELLING SHIPPING and COALING ADVANTAGES

USE LOURENCO MARQUES' RAILWAY and HARBOURS

THE MOZAMBIQUE TREATY

THE PROOFS OF BAD FAITH

As regards the Convention the essential facts can be condensed into a few tell-tale and convincing figures. And that they may be fair to the foreign port we shall take them from the Portuguese records, supplementing to a small extent the figures of our Portuguese contributor on page 111, so as to bring out the Union position.

According to the terms of the Convention the import trade to what is called the "competitive area" must be divided between four Cape ports and Delagoa Bay. From 50 to 55 per cent., that is a half as a minimum, is allocated to Delagoa Bay; Durban should get from 30 to 35 per cent., and the balance is divided between Capetown and other Cape ports. If the percentages vary so as to deprive any port of its due share, the matter is put right by an alteration of the railway rates. The railways are in effect the stabilisers of the agreement. An important provision is that the Portuguese railways shall charge no more than the Union railways, and the port charges shall not be higher than the lowest Union port charges.

Various adjustments were made before the War to secure the percentages fixed under the Convention. In 1912 changes in rates and tariffs were made, and these began to pull down the Portuguese percentage, as will be seen from the figures that follow. It should be explained that the goods imported are charged under two "groups" of railway rates and port charges.

The Record of a Decline.

In 1912 the Lourenco Marques' total of traffic was 268,436 tons, equal to 55.43 of the total traffic; the Union ports received 44.57 per cent.

In 1913 the total was 240,394 tons for Lourenco Marques, being 51.39 per cent., and in 1914 the tonnage fell to 179,399 tons, or 48.78 per cent.

In the next year, War conditions began to operate, and the totals were: Lourenco Marques 119,759 tons, equal to 36.17 per cent.; Union ports 211,325 tons—equal to 63.83 per cent.

Doubtless the restriction of the shipping business to British and Allied shipping, such as Japanese, affected the popularity of Lourenco Marques. But the Portuguese claim that they were one of the Allied powers, and in the issue of shipping licences should not have been discriminated against. For as the War went on the handicaps on the Portuguese ports increased.

In 1916 Lourenco Marques registered only 103,336 tons, while the competing Union ports returned a total of 228,061 tons. The percentages were 31.19 and 68.81 respectively. Next year the figures improved from the Portuguese viewpoint, the percentages being: Lourenco Marques 35.41, and Union 64.79.

The last year for which printed records are available saw the diminishing process continue, the Portuguese figures being 48,876 tons for the year, giving a percentage of only 28.10 instead of 50-55, as laid down in the treaty. The Cape railway report makes these figures even lower, presumably because the Cape railway returns are made up to 31st March of each year. Only 25.91 per cent. is recorded as Lourenco Marques' share for the year ended 31st March, 1919.

Thus, the net result of the last adjustment of tariffs made in 1912, plus War conditions, was been to make the Convention an adverse factor in Portuguese development. Without a Convention, rates and port charges could be so regulated as to secure for Lourenco Marques a fair share, even the major share of the traffic. But the Convention if observed as it is observed by the Portuguese, prevents any such use of their natural geographical advantages. They are asked to stand by and see their business taken away and their province impoverished under an agreement which binds them and does not bind their co-signatories.

The conditions of the Mozambique Province are peculiar and artificial under the Transvaal agreements. In the first place the surplus native labour is drained away from Portuguese territory to enrich a neighbouring foreign colony—the Transvaal; and in the next place the Convention strictly regulates the commercial traffic through Portuguese ports, and so governs and regulates the revenue of the country and the extent of the business carried on by Portuguese citizens.

Stated in these bald terms it can be quite understood that our neighbours are very dissatisfied, and are slowly reaching that state of mind that demands a mending or an ending. But this is not the whole of the Portuguese case for a revision of relationships. There is the Swaziland railway question.

AN UNFINISHED RAILWAY

A GRIEVANCE AND ITS CONSEQUENCES

About £400,000 was spent by the Portuguese in building a railway which is still waiting on the Portuguese side of the Swaziland border for the linking rails which will justify the expenditure. Swaziland, we may say, was a native reserve originally, but much of it is now held by white owners. The control rests still with the Colonial Office in London. It is in effect a Crown Colony. It comes into this story merely by virtue of its position between Portuguese and Transvaal territory, and is in no way concerned in the history of what is usually referred to as "the Swaziland Railway." In reality the question at issue is the construction of another line of railway from the Transvaal to Delagoa Bay.

A Transvaal Proposal.

Now, in 1904, when this matter first took shape, the Portuguese were not particularly interested in building a second railway line from the Transvaal to Lourenco Marques. Their existing line from Komatipoort to the Bay is only 50 odd miles in length, and this short length of line can easily be doubled or otherwise improved so as to carry many times its present traffic.

But the Transvaal was in a different position, because the railway line from the Rand to Komatipoort was a roundabout line that first went from the Rand north to Pretoria before it began to run eastwards to Delagoa Bay. Besides, that Pretoria-Delagoa line went down the valley of the Elands River and is full of heavy gradients and short curves.

The High Commissioner, Lord Milner, who was charged with the task of rebuilding the war-broken Transvaal, wanted a direct line from Johannesburg to the nearest port and he proposed to the Portuguese that a new line between the Rand and Delagoa Bay be commenced forthwith, leaving the Pretoria-Portuguese railway to its original task of opening up the agricultural resources of the Transvaal. This new line was intended to be a direct railway on the shortest possible course to carry the heavy traffic between the great gold mines—whose future was outlined in gorgeous terms—and the sea. Portugal was asked to make the plan possible, and Portugal agreed; and each of the parties to the agreement, the Transvaal and Portugal, began to build towards each other. Portugal finished her building and the Transvaal did not.

Some Evidence

That this was the genesis of the Swaziland Railway was made clear by the evidence given by Sir Thomas Price, the General Manager of the Transvaal Railways, before a Commission which inquired, in 1904, into a proposal to connect Witbank directly with the Rand in order to supply coal. It was a private proposal by a speculating syndicate.

Sir Thomas Price was questioned about the new Swaziland Railway, and stated that the Transvaal end would soon be built to a specified point, and that an engineer (we quote) " is coming out for the Portuguese Government next month to start building their end of the railway from the tenth kilometre out of Delagoa Bay." Sir Thomas Price gave his evidence before the Commission mentioned on the 21st Dec., 1904. The date of the starting of work by the Portuguese is thus fixed. Having once started they continued building, as indeed did the Transvaal. But Lord Milner was removed by the Liberal Government, and two or three years later the control of the position passed to an elected legislature—which stopped building the line.

The Testimony of Goba.

That political influences flooded in is probable enough. We need not deal with them nor with the events which followed after 1905. The main issue is that the representative of the Transvaal and of the British Government made a promise to a neighbouring Government to carry out certain works, and that this promise has [illegible] out. And in this job the tricked party has spent [illegible] sums of money. We give an illustration of the great railway bridge built by the Portuguese on their [illegible] "Swaziland Railway." It is part of a line built to [illegible] heavy traffic, a line that cost about 9,000 per mile. The Portuguese section ends near the Swaziland border [illegible] a slope that leads down to a shallow valley. [illegible] right is the Umbelusi River, whose valley [illegible] line of the railway into British territory. The Portuguese railway ends in two turned up rails, turned [illegible] engines running on to the ground, where [illegible] rails should be. Nearby is all the evidence [illegible] any observer that they relied on a British [illegible] stone breaker (by Hadfield's, England) and the temporary boiler and engine (by Fowler & Sons, England) still stand where they stood when breaking rock for ballast. Near them are the rusty coils of the wire rope that operated the line of ballasting trucks. The Portuguese will lose on that stone-breaking plant left there in mute testimony of the confidence they felt in the word of the English. It has been there ten years. Now there is a little bush—one of the compositae—growing from the soil on one of the engine cylinders. Not all Fowler's men could put that cylinder right again.

Portuguese Swaziland Railway.—Bridge over Umbelusi River.

In ten years confidence weakens. The position now is that the railway stands as incontrovertible evidence that no reliance can be placed on the promises of the Union Government. So, naturally, it is of little use alleging to a Portuguese that he can trust his fortunes and that of his country in an alliance with the Union of South Africa.

The First Step.

The whole matter of a big coal export trade in the near future depends upon coming to an arrangement with the Portuguese. First, they supply the labour that gets the coal to the " bank " at a cost of less than 5s. per ton. Next, they hold the sea outlet of the Transvaal coal fields; and lastly, they can terminate the Convention at any time and put up their rates against the coal owners. The Natal railway, as we are told officially, can carry a forty per cent. increase only and cannot satisfy the ordinary expansion to be looked for in the Natal coalfield itself. The only escape from the awkward situation is to make St. Lucia Bay the outlet of the Transvaal, and such a proposal means making a new harbour out of a sandy lagoon—a task involving millions of money and years of labour, and the fierce opposition of Durban.

Lord Milner, who is the Colonial Secretary and ruler of Swaziland, ought to attend to this matter. His honour is involved. The Portuguese have [illegible] with a pair of broken rails with their ends turned up to heaven!

It is time that the whole question of Delagoa's position in South Africa be determined. The time is favourable. But the credit of the British must first be restored. It is impossible to make any new promises, such as would be necessary, for example, if the Portuguese Province became a member of the Union of South Africa under certain reservations.

The line to Goba must be built, and compensation paid for all these years of political expediency and trumpery local jealousy. Then other proposals may be considered by the injured parties.

RAILWAY TAXATION OF COAL.

AN ADVERSE FACTOR

FROM the evidence so far given the inference must be drawn that the railway position in South Africa is not favourable, viewed from the standpoint of a progressive coal owner. He would be compelled to limit his plans first to the capacity of two single line tracks, winding down steep gradients to ports hundreds of miles distant, and, secondly, he would find his efforts to increase his output and his profits almost nullified by the limited equipment of the railways. And there is a third adverse factor, perhaps the most serious of all: he would find that the State is embarked on a financial policy that in its ultimate analysis is one of bankruptcy of the coal industry and even of the great railway system itself.

UNBALANCED POLICIES.

In a limited summary of facts and circumstances such as this is necessarily, the details cannot be set out in any fulness. There is a long history behind the policy that is arraigned to-day, not only by the coal owners, but by the travelling and consuming public, a history we cannot go into. Its leading feature is an unbalanced reaping of the profits of the nation's business. Whether railways owned by the State should be engines of taxation has long been a controversial subject, but there can be no controversy at all about a policy of taxation and repression of limited sections of the community and the freeing of other favoured sections from all taxation and all burdens. Mr. Burton, the Minister of Railways, will do well to make an effort to substitute sounder finance for the exciting but nationally dangerous pastime of vote-catching. His railway business is heading for disaster.

A Report, drawn up by Sir William Hoy, the General Manager of the Union Railways, was issued a week or two ago, and the position is thus revealed up to the end of March, 1919. It is a Report of 132 pages of letterpress and analysis, supported by 73 additional pages of illustrative and statistical matter. Naturally we cannot deal with its tumescent pages: our examination must be limited to a few figures that express the principal results of the year's and past years' working, and throw light on the railway's principle of taxation.

The General Manager summarises the " Results of working (Railways) since the year 1909, the year prior to Union." It must be noted that " Harbours " are also dealt with in the Report. But we shall not concern ourselves with Harbours except to suggest in a later note how the harbours could help in the salvation of the Railways and its dependent industries such as coal mining.

SOME IMPORTANT PERCENTAGES.

In 1913 there was much industrial trouble in South Africa, and in that year the results of the railways working were abnormal. In 1914 the War had its influence. We must go back, therefore, to 1912 as the representative of the Railways' position and normal progress from the year 1909. That year, 1912, was the culmination of several normal years: after that year the figures are disturbed by special developments and events that influence the totals. This must be borne in mind in reading the following comparisons.

It is difficult to get a total which will give us a fair average expression of the railway's working. " Train miles run " seems to be the fairest basis, but readers can made their own choice in attempting to arrive at sound conclusions regarding the financial policies that lie behind the figures. And as the analysis is only a rough one we will deal only with the first three figures representing the millions and the first hundredth thousand. Thus 282 represents the total of 28,173,706 train miles run in 1912. Again 311 represents 31,092, 219 train miles run in 1919 (the railway year ends on the 31st March).

In this case of " train miles run " the increase in eight years, between 1912 and 1919, was 10 per cent. (We confine ourselves to round figures.) The number of miles run is a fair test of the energy, mechanical and human, expended during the year. A train is moved in order to carry goods or passengers and in this work the plant and staff is employed and earns the revenue of the business

Thus, the next contrasting figure we may take is " Total earnings." The figure as explained is 125 for 1912, and 153 for 1919. In this case the increase is 22 per cent., showing that the revenue per train mile run has increased. And in the column " Earnings per train mile " we find indeed that the earnings in 1912 were 8s. 10d., and in 1919 9s. 10d. per train mile.

Whence was this additional revenue obtained: that is, from what source? Passenger revenue increased by 27 per cent. in the period taken; goods earnings by 6 per cent.; live stock takings by 34 per cent., and coal takings by 60 per cent.

" GOODS " AND " COAL."

In these percentages the two items we can compare are " Goods " and " Coal," which with " Passengers " constitute 90 per cent. of the Railway's revenue. And as between " Goods " and " Coal " what do the figures reveal when we take the tonnages carried in each case? The tonnage of " Goods " carried increased by 25 per cent.; the tonnage of " Coal " carried increased by 16 per cent. Thus the result can be expressed in the following table, which covers the period 1912-1919:—

	Tonnage carried. Increase.	Earnings Increase.
Goods	25 per cent.	6 per cent.
Coal	16 per cent.	60 per cent.

Some explanation seems necessary to make these figures mean something more than unbalanced robbery, but we do not get any explanation that really explains. We would be justified in fact in leaving them in their stark significance and let coal owners themselves arraign the Minister and his policy of taxing South African producers during war time, while opening the door for the profiteering of oversea non-producers. But capitalists elsewhere who may be inclined to look to the South African coal fields as a field for their energies would probably like this reference to taxation disabilities carried a little further.

THE OFFICIAL EXPLANATION.

Here is Sir William Hoy's explanation, if we are not mistaken. He writes under the heading " Financial Results since 1909 ": " The continued decrease in high-rated sea-bound traffic," he says, " due to restricted shipping and to the difficulty of obtaining oversea manufactures during the War has adversely affected railway earnings. The decrease in tonnage has been more than counterbalanced by a remarkable expansion in domestic traffic, but local traffic is, of course, of a different description and is carried at less remunerative rates. Notwithstanding recent increases in rates the average earnings per ton of goods carried have dropped from 27s. 7d. in 1910 to 19s. 11d. in 1918-19, due mainly to the increased ratio of low-rated traffic as a result of internal development."

A HEAVY LOSS.

Before making any comment on the above statement we will give here the financial results of the working of the railways in 1919. Sir William Hoy's Report contains the following interesting figures:—

Total earnings in 1919	£15,282,279
Gross working expenditure, 1919	11,680,873
Surplus of earnings, 1919	3,601,406
Interest on capital expended	3,213,842
Net loss (including charges)	896,267

Railways then showed a loss of nearly a million last year. They have been approaching the loss margin for some time past; last year they actually passed it. To mitigate this loss coal rates have been increased.

It would take us too far to discuss all the causes of this loss, which has reacted so heavily on coal taxation. But the main source of the loss can be pointed out. There has been an increase in the average cost per mile run. In 1912 the average cost per mile open was 4s. 10.3d.; in 1919 this item had risen to 6s. 5.8d. There should be some explanation of this rise in costs. Railway coal has certainly not been dearer, and the cause must be sought elsewhere. The low-rated local traffic to which the fall in earnings is attributed by Sir William Hoy, can be carried as cheaply as oversea goods, and would not explain the rise in costs.

The Nigger in the Wood Pile.

It is the labour policy of the Railway Administration which is responsible for the rise in costs, and therefore for the loss on working, and consequently, indirectly, for the immense increase as set out above in the percentage of railway charges on the coal traffic. The figures point clearly to the weak spot in Mr. Burton's administration. "Train miles run" have increased, as we mentioned above, by 10 per cent. since 1912. The labour staff has increased from 55,273 in 1912 to 70,243 in 1919—an increase of 27 per cent!

The total includes white and coloured workers. Thus it appears that the Railway Administration is now overstaffed compared with the position in 1912. Casual observation along the lines tends to confirm this conclusion. Able-bodied 12-stone white men are employed in such jobs as washing carriage windows, sweeping corridors, and picking up stray bits of paper on the railway lines. No wonder the rate on coal has increased 60 per cent. Quite recently an additional ten per cent. was added. And if the policy of employing hefty and intelligent white men as charwomen is continued another ten per cent. increase will soon be necessary!

Business men must, of course, take these weaknesses of railway control into their calculations. A good deal more could be written on the matter, but our object is only to indicate disabilities, whether natural or human, that affect the possibilities of an extended coal export trade. And the tendency to lose money on the railways in the interests, not of the country's producers, but of the non-producers who work the railways, must be kept in mind as a factor that may be sufficiently permanent to affect seriously the prosperity of the coal producers and of the consuming public generally. Each of these sections is being "profiteered"—the first by the Government, the second by the merchants.

The Waggon Shortage.

Another subject of which much is heard at present is the failure of the railways to carry the coal traffic offering. Irate coal owners in every field declare that if more trucks and engines had been available they would have largely increased their output. The whole coal industry, it is said, is at the mercy of the railway authorities, who have failed to estimate reasonably the extent of the coal advance, and so have been caught with inadequate rolling stock.

The Railway's Case.

In reply the railways shift the issue somewhat. It is not trucks they say, but engines that are in short supply; and engines could not be got for love or money or by entreaty. But they meet the truck controversy with a counter charge. The coal owners, they say, do not possess storage bins either at the mine or at the selling terminus, and consequently use the trucks as convenient movable storage bins. The trucks therefore stand and wait, and for days nothing happens. Meanwhile the mine is waiting for the standing trucks at the ports, if it is not indeed holding up a second lot of trucks while it gets the coal out at the mine. It is waiting in fact for its own quota of trucks.

Coal Bins.

The controversy may be left to the disputants. What does seem necessary is the provision of more coal bins. These cost money, but a company cannot reasonably complain about coal trucks if it has no bins. At Durban the difficulty has been met to some extent by stacking the waiting coal on the ground. But no large grabs are available for lifting the coal from these stacks, and once on the ground the coal must be shifted and loaded into the bunkers by natives. Large grabs taking 6 or 8 tons at a time such as are in use in other world-ports, would greatly help to get rid of the congestion by allowing ground stacks to be more used. At present they add to the cost of loading, and are not popular. But it is not good business to use valuable trucks for storage, and the whole question needs attention.

MARITIME PROBLEMS

SOUTH AFRICA'S COAST-WISE TRADE

We have outlined in very brief fashion the effect of our limited main railway system on the coal traffic of South Africa, and secondly the effect of the State's system of railway management so far as this reacts upon the cost of the land transport of coal. A few words must be added now upon the question of sea transport and its influences on coal markets and distribution.

Oversea Competitors

There are two main divisions of this business looked at from our present narrow viewpoint. External and internal conditions must be reckoned with. As regards the external or foreign factors our introductory notes suggest the wide range of competition to which South African efforts to secure oversea markets will be subjected. But this competition will be greatly influenced by the after-war conditions, referred to in those notes, as likely to hamper [illegible] the coal trade of Europe and America.

At the same time it would be a [illegible] suppose that post-war conditions will keep Europe [illegible] out of the Indian Ocean ports in all [illegible] Our railway authorities appear to be possessed with [illegible] idea. Taxation of coal per railway rates [illegible] Administration on the ground appar[illegible] coals at South African ports are cheaper [illegible] Any increase in railway charges will not affect the market; ships will still call for South African coal—so runs the argument.

Bunker Coal Prices.

"South Africa," says Sir William Hoy, in his report, "is one of the cheapest bunkering stations in the world. Each year its coal exports constituted a record, and to-day there is a market at the ports for more coal than the (Railway) Administration can carry."

In another place he writes: "To-day bunker coal is sold at Durban at 35s. to 37s. per ton, while the price of bunker coal in England is £3 to £5 per ton; at the Islands (Canary) about £5 17s. per ton; at Port Said £6 5s. per ton; at St. Vincent £7 10s. per ton, and in South America from £7 5s. to £7 15s. per ton. There has recently been a considerable market for South African coal in South America, Egypt, Australia, and the Far East, and a large export trade should be assured, given adequate shipping and rail transport facilities."

With these impressions Sir William Hoy seems to have advised an increase on the railway rates for bunker coal at the Union ports. Recently a further ten per cent. increase has been added to rates on coal carried. But the latest news from England and America suggests that these increases are somewhat premature. The price for export coal is coming down rapidly in England. Replying in the House of Commons on the 17th of December to a question on this subject Sir Auckland Geddes stated the tonnage of coal produced in Britain in 1919 was 208 million tons, and of this quantity 32 millions were shipped for export. The average price at which this export coal was shipped was, he said, 45s. per ton.

England Coming In

Comparing this price of 45s. per ton for the high class shipping coals of England with 37s. per ton charged for Natal coal at Durban it is already evident that Natal coal cannot compete at such prices with English coals at, say, Suez. If shipping freights are high for English coal to Suez they will be high also for South African coal. The idea that South African bunkering coals are superlatively cheap needs correction. If South African coal owners wish to have a fair field they must take up this matter with the Government at once. It is plain that English coal will keep its old markets even under our noses if all the possible profit of our coal mines is annexed by the railways.

American Ships.

There is another factor which was deemed to affect American competition. Ships, it was said, would be wanting. This also is an inference which facts are likely to falsify. America is building ships so fast that at quite an early date the shipping shortage will pass away. Recent figures made public by the American Shipping Board show that the American shipyards are now launching four ships a day or more than 100 per month. Many of these new ships are cargo steamers, and all are of a tonnage large enough to count in the growing total.

Such a rate of production will soon influence the whole difficulty arising from shortage of shipping. It seems probable that ships will soon be available in excess of the demand. Some time early next year we must expect to see this reversal take place. Its effects on the supply of British ships will be immediate, and coal will once more come East, not indeed at its old price, but at a price that will suffice to prevent South African coal from getting a footing in the new markets.

Experts Wanted.

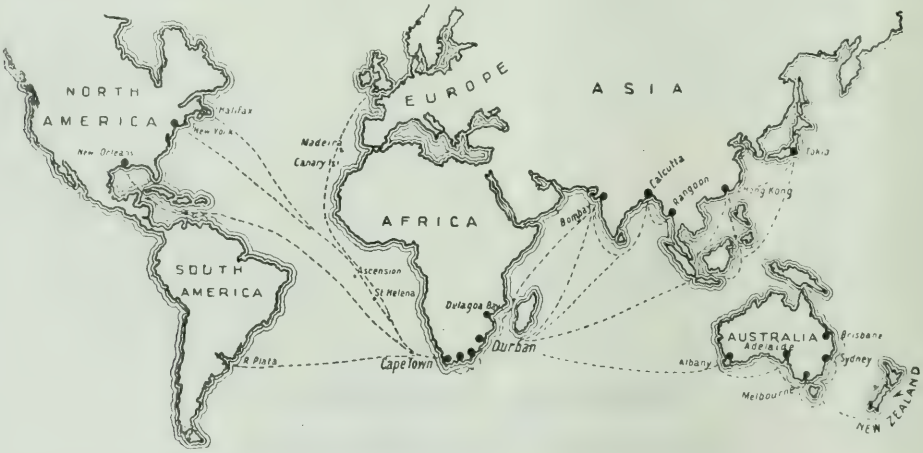
In the circumstances the prices at which bunker and cargo coal can be sold at South African ports should be studied, having in mind the existence of strong competitors who may rapidly recover their old transport facilities, leaving them burdened only with the extra cost of mining coal. A reduction in the price of S.A. cargo coals to 30s. will place our coal producers in a strong position to force their way into all the dearer markets of the East.

The conditions affecting this sea transport trade should be examined by competent men. Usually ships from Europe for the East, that is liners and large cargo boats, fill up bunkers at Port Said at the north end of Suez Canal. The coal taken is usually from England.

From this point ships pass on to Colombo in Ceylon, unless Aden is in the list of ports, when some coal is taken on at that station. At Colombo South African coal may find a market. Indian coal is usually supplied at Colombo. It is a volatile coal with a good deal of ash.

Eastern Prospects.

For shipping plying along the great Eastern routes the openings for South African coals are limited. It is at special importing centres such as Bombay or other points along the Indian coast that markets may be secured, especially where coal is wanted by the Indian railways returning inland. The list of ports and places of call which we publish with a table of distances from South African ports, will be found useful in seeking for possible openings. At the same time the fact that a number of new coal mines which can supply coal are being opened up in the East Indies must be borne in mind. The Chinese market is too remote for South African coal, as Japan comes into competition. Singapore, the great port on the Malay Peninsula, marks the eastern limits of our possible coal markets. The small map of the world which we print will remind readers that South Africa occupies a very central position in relation to the Eastern and Western Hemispheres, and her command of the coal trade is a question more of quality of her coals than anything else. A high grade coal with a heating value of about 14.5, such as is supplied by America and Wales, would command the markets east of Suez, and as far west as the eastern ports of South America. Can we supply such high-grade coal?



Map of the World. South African Coaling Ports central.

As regards the loading facilities at South African ports, they will be found to be fully described in another part of this issue. The plant is mostly of the crane or tipper class. Grabs, which are so largely used in all the ports of the world, have not yet found favour. An increasing trade, however, will probably compel the authorities to load from ground stacks, and grabs may then become more popular.

Coaling Plant at Capetown.

It should not be overlooked that plans are projected for the erection of a large coaling plant at Capetown, where it is hoped to establish a considerable bunkering business. Contractors who have any new appliances should submit them, for it cannot be said that the last word has yet been said in the economic handling of large quantities of coal at coaling ports.

SHIPS FOR THE COAST TRADE.

Our space is limited, and we have room for only one other matter affecting the country's internal coal trade.

In order to bolster up a weakening railway position the present policy of carrying all coals by rail has been forced upon the Administration. But the merits of sea transport coastwise cannot be ignored in any readjustment of the existing channels of movement. The quite extraordinary policy of sending coal from the Transvaal and Natal overland by rail to Capetown has been in action for some time past. Whether it can be justified by any economic argument seems doubtful, for the distances exceed a thousand miles, and the wear and tear on rolling plant must alone go far to neutralise any possible balance of profit recorded in the books. But Capetown had to have bunker coal, and the railwaymen, not being sea dogs, sent the coal by rail overland.

It is unfortunate, we think, that the dual nature of the Administrations' work is not kept in mind. The harbours of the Union are combined with the railways under one administration, and the claims of the harbours should have been considered in this matter of supplying coal from the Natal and Transvaal fields coastwise to the chief towns and ports of the country.

RAILWAY TRUCKS *v.* SHIPS.

In 1918 over half a million tons of coal were handled at Capetown. In 1919 this quantity for various War reasons fell to 283,000 tons. The estimated quantity which that port will handle when conditions are normal may be put at half a million tons. These are sent down at present over a thousand mile land journey in railway trucks, averaging, say, 40 tons of coal cargo each. Counting the return journey each truck travels 2,000 miles behind locos, which also travel 2,000 miles every trip.

It is not necessary to work out the figures. The plain fact is that a considerable number of trucks and engines are detached for this labour of carrying coal overland. The value of the railway plant so employed must be large, probably not for from £200,000, and the labour wasted in shunting and delays on a single line of railway running over vast distances must be heartbreaking enough to make a Karroo antheap weep.

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Capetown wants coal, and being on the coast should get her coal by sea. Two big colliers of ten thousand tons each could make 18 trips a year each from Durban to Capetown and so carry nearly 400,000 tons of coal—which would suffice for present requirements. The cost of the two tramps would be about £300,000, or not much more than the cost of the railway plant now employed. Wear and tear would be infinitely less, and the service would be constant and regular and capable of being supplemented at any time. They should be hard weather craft without any frills, but powerfully engined, as the weather off the Cape of Storms is sometimes rough.

The effect of this diversion of coast coal traffic to the sea would be felt at once in the towns. Industries would spring up. Coal could be sold at only 5s. per ton (that should be the sea freight to Capetown) added to Natal or Transvaal pit cost—plus of course the charges on the land journey by rail to the coast harbour at Durban or Delagoa Bay.

One conclusion from these considerations is that a seaman is wanted on the Harbours and Railway Board; or, say, as private secretary to Mr. Burton, the land manager of South Africa's transport.

TABLE GIVING APPROXIMATE DISTANCES IN NAUTICAL MILES FROM DURBAN AND DELAGOA BAY TO THE PRINCIPAL PORTS LIKELY TO SEND COALING VESSELS TO SOUTH AFRICA.

	Durban.	Capetown.
Aden	3,200	4,050
Albany	4,550	5,000
Ascension	3,220	2,380
Barbados	6,023	5,284
Beira	755	1,505
Bombay	3,800	4,650
Buenos Ayres	4,590	3,750
Calcutta	4,735	5,455
Chinde	690	1,150
Colombo	3,625	4,345
Dar-es-Salaam	1,595	2,445
East London	290	570
Freetown	3,970	3,130
Halifax	7,350	6,510
Hobart	5,250	5,700
Hong Kong	6,391	6,966
Inhambane	450	1,300
Karachi	3,875	4,725
Las Palmas	5,315	4,475
London	6,990	6,150
Madeira	5,540	4,700
Madras	4,045	4,805
Mahé, Seychelles Islands	2,100	2,960
Mauritius, Port Louis	1,530	2,250
Melbourne	5,450	5,900
Mombasa	1,765	2,615
Montevideo	4,500	3,660
Montreal	7,877	7,108
Mozambique	1,030	1,880
Nagasaki	7,319	7,894
Newcastle, N.S.W.	5,985	6,435
New York	7,640	6,800
Panama	7,230	6,460
Penang	4,750	5,325
Port Nolloth	1,135	290
Port Said	4,563	5,346
Quebec	7,860	7,020
Quilimane	745	1,595
Rangoon	7,745	5,465
Rio de Janeiro	4,125	3,275
St Helena	2,540	1,700
Shanghai	7,134	[illegible]
Singapore	5,135	5,710
Stockholm	7,770	6,930
Sydney, N.S.W.	5,925	6,375
Valparaiso	6,100	5,477
Walfisch Bay	1,585	745
Wellington	6,575	7,025
Yokohama	7,775	8,350
Zanzibar	1,625	2,745

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NATAL'S COAL TRADE.

A GENERAL REVIEW.

I.—The Development of the Industry and of the Port of Natal.

In the past few years the Port of Natal—Durban—has enjoyed a steadily increasing measure of prosperity, and the general belief is that Durban is going to gain further in importance, as one of the leading towns washed by the Indian Ocean, rather than lose any of the ground which it has so far gained. During the war Durban's trade has risen very substantially, largely in consequence of the restrictions on the Suez Canal route to Europe. No small measure of this prosperity has been brought about by the development of the bunkering and export coal trade. Two hundred or two hundred and fifty miles from Durban are some of the most extensive and high-grade coalfields in Africa, and it is an indisputable fact that these areas are capable of producing an infinitely greater tonnage of coal than they have yielded so far. The present output is limited by truck shortage on the railways and also in a lesser degree by the supply of native labour available. All the same, Durban, as a coaling port, has risen to a position unexcelled in the southern hemisphere. With the erection of extensive coaling appliances and up-to-date machinery, steamers can be bunkered most expeditiously day and night, with a minimum of breakage of coal during handling, and high quality fuel can be obtained at reasonable cost. The largest vessels can enter the port with perfect safety, and the bunkering trade, which may be said to have commenced in 1898, has since shown a steady record of success and advance.

Durban Navigation Collieries, Dannhauser. The No. 1 Colliery.

A Well-Equipped Port.

Durban, Port Natal, is situated on the south-east coast of Africa, in latitude 29 degrees 52 min. 48 sec. south, and longitude 31 degrees 2 min. 48 sec. east, and is denoted by a steep thickly-foliaged promontory, or "Bluff," crowned by a light tower (white) 81 feet in height, and the Signal Station.

The Bluff is easily made out, the coast to the northward falling a little back and being low for several miles. There are no outlying dangers in approaching the Cape, and the water is deep close to the land. Care must, however, be taken in making the port from the south-west not to approach the shore nearer than four miles, or stand into a less depth than 40 fathoms of water until the light is seen from the deck, when the vessel will be northward of the Aliwal Shoal.

Durban possesses one of the best equipped and most accessible harbours on the coast. It serves Natal, Zululand, Orange River Colony, the Transvaal [illegible] which it is a popular port of shipment—and other parts of South Africa.

Time was when an awkward bar prevented other than light vessels entering the inner harbour. To-day, as the result of the enterprise of the Government, this impediment is a thing of the past, and the largest vessels enter the port with perfect safety, *night or day*, and land their passengers and cargo on the wharves.

Being only 485 miles from Johannesburg, Durban is a near and convenient British port to that great mining centre and commercial emporium, the excellent railway facilities also placing the port within quick access of other parts of South Africa.

The History of Natal Coal.

Coal was first discovered in Natal so long ago as 1838, but for many years very little attention was paid to this asset of the country. [Probably the most valuable statement that has yet been made on the Natal coal industry is that submitted to the Dominions Royal Commission by Mr. J. Townley Williams, upon which we have drawn for much of the information in the following.] As to the extent of the Natal coalfields, there is an exhaustive report in existence, dated September, 1881, by F. W. North, an English mining engineer, and Fellow of the Geological Society. Mr. North was appointed by the late Natal Government to investigate and report on the coal measures of the Colony. He was engaged on the work for fifteen months, and finally estimated that Klip River County, Northern Natal, contained 2,073 million tons of coal, after deducting 50 per cent. for dykes, faults, etc. The report did not include the extensive coal-bearing areas of the new districts, Utrecht and Vryheid, which were

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added to Natal after the Boer War, nor does it include the coal and lignite deposits of Zululand. The lignite deposit in Zululand is extensive, but so far, nothing has been done with it. It was not, however, until 1889 that any serious attempt was made to develop the coal measures. At that time, a number of companies came into existence, of which only two, the Dundee Coal Company, and the Elandslaagte Coal Company, have survived. (The original field floated by the Dundee Company was exhausted some years ago.)

The Dundee (Natal) Coal Co., Ltd., was formed to prospect, work and sell any coal that might be found on a farm adjoining that of one Peter Smith, on whose property coal had been laid bare by the force of a flood.

Shafts were sunk, and the coal was found to be of good quality. For the first year of working, that primitive vehicle the bullock wagon, had to be resorted to for transportation of the mineral from the pit mouth to the consumer. The trade in coal was mainly confined to local requirements until September, 1898, when a Commission was appointed to enquire into and report upon the best means of fostering the coaling industry, and cheapening the price of the coal at the Port.

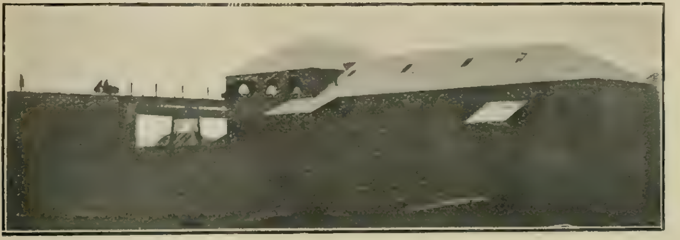
In 1889 a branch line was made by the Dundee Coal Co., Ltd. (a new concern which had absorbed the pioneer company), which line connected the Dundee property with the Natal Government railways at Glencoe. About eight years later this branch line was taken over by the Natal Government railways and continued to Vryheid, where the Dundee Company had acquired a fresh coal-bearing area. To further extend their operations, they acquired other property, including the Burnside Mine, which, in the opinion of many, yields one of the highest quality coals procurable in Natal, and absorbed the St. George's Coal and Estate Co., Ltd. This company now owns about 20,000 acres of good coal-bearing ground, and in addition, has mining leases on adjoining properties. It may justly be regarded as the pioneer company of the Natal Coal Fields. Many of the remaining companies came to an end for various reasons, including the inexperience of the promoters, directors and managers. Ground was floated without adequate prospecting. Narrow seams were expected to yield a profit: inadequate working capital was provided: and this not wisely spent. In 1898, the serious strike of miners in the Welsh coalfield increased the price of coal produced elsewhere, and led Transvaal mining men to the Natal coalfields. Two of the companies they promoted—the Natal Navigation Collieries, and the Natal Marine Collieries—turned out successfully. The former is still in existence, but the latter was exhausted in 1903, after distributing in cash 20s. 6d. per share. The high prices for coal obtained during the Boer War led to further promotions, and increasing attention came to be paid to the Natal coalfields. During the Great War Durban came greatly to the fore as a coaling port, and to-day there is a demand for Natal coal which is greatly in excess of the supply.

THE AREA OF THE COALFIELDS.

From Mr. North's estimate of 2,073 million tons, it would seem at first sight an easy matter to float any number of coal companies in Natal, but closer acquaintance with the nature of the coal deposits and of the geological characteristics of the district proved that the coal in some areas was not suitable for the best markets. A proportion is unsuitable because it is anthracitic, and cannot be used on the railways, nor by steamers trading with the Province, other areas are broken up, and in some parts the seams are thin. There still remain immense tonnages in existing properties and enormous areas of coal untouched by the prospector and promoter—an asset of great value to the future well-being of the Province and to the whole of South Africa. A few figures in regard to the expanding coal trade of Natal and of South Africa as a whole should here be of interest.

OUTPUT STATISTICS.

In 1899 Natal's output was 28,700 tons, whilst in 1916 it was 3,366,202 tons, an increase of 33 per cent. over the previous year, and 80 per cent. over 1907. In 1916 the annual output of the whole of South Africa rose to over 10,000,000 tons. In 1906 the coal bunkered in Natal amounted to 846,000 tons, and in 1916 to 1,000,000 tons. In 1916 the whole South African output was 14 per cent. better than that of 1913, which was the next best year. In 1916 the tonnage of bunkering and cargo amounted to over 3,000,000 tons, or 500,000 tons more than in 1913. At Durban alone, in the year 1918, the coal bunkered amounted to 675,160 tons, and coal exported to 664,780 tons. The following figures are of considerable interest, inasmuch as they exhibit the outputs of Natal collieries for successive years since 1914:



DURBAN NAVIGATION. THE NO. 2 COLLIERY

Collieries.	1918.	1917.	1916.	1915.	1914.
	Tons.	Tons.	Tons.	Tons.	Tons.
Dundee (including Burnside and St. Georges) ..	336,528	369,914	412,510	320,830	379,373
Hlobane . ..	331,055	410,276	411,060	310,842	253,845
Natal Navigation ...	266,801	304,743	369,394	290,001	318,240
Durban Navigation .	213,373	237,018	248,407	248,985	222,658
Tendega . ..	145,503	119,323	18,365	—	–
Natal Cambrian	133,855	161,843	188,596	88,028	139,215
Wallsend (Natal) ...	125,234	139,082	97,151	55,010	25,176
Natal Steam	98,457	95,239	92,141	75,963	54,257
Utrecht	96,374	96,767	150,673	90,370	183,292
Glencoe (Natal)	86,385	140,593	186,798	153,065	168,883
Ballengeich	81,145	119,765	122,566	56,422	41,564
Northern Natal Navigation	72,706	102	—		—
Newcastle	71,322	80,663	80,619	51,346	58,211
Elandslaagte	64,891	65,948	67,409	53,550	148,257
South African (Bannockburn)	58,568	89,669	129,667	97,252	107,873
Natal Ammonium ...	43,942	24,840	13,112	10,450	1,165
Enyati . .	35,487	—	—	—	–
Bernica	33,393	3,948	–		-
Vryheid Coke Co. .	11,687	11,239	8,496	6,503	5,764
Dewar's Anthracite .	11,047	10,140	9,976	7,560	8,911
Avon	7,453	6,536	5,711	4,193	4,048
Hatting Spruit	3,146	67,274	101,739	108,544	114,465
Little Hlobane	557				—
Austin W. P.	384	622	462	-	-
Jas. Malcolm	177	—	—	—	—
Fairleigh	—	23,350	42,826	39,833	32,643
Ingagane	—	18	-	—	—
Standard	—	6	–	—	—
Ramsay	—	—	—	1,956	50,101
Makatees Kop	—	—	—	316	—
Kreszmann	—	—	—	52	—
Star	—	—	—	—	-
Total	2,329,470	2,578,918	2,757,678	2,071,371	2,318,241

The increase in 1913 against 1912 was 136,173 tons, decrease in 1914 against 1913, 289,113 tons, decrease in

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1915 against 1914, 246,870 tons; increase in 1916 against 1915, 686,307 tons; decrease in 1917 against 1916, 178,760 tons; decrease in 1918 against 1917, 249,448 tons, owing to war conditions and influenza epidemic.

The Natal Colliery outputs for the first ten months of 1919 have been:—

October, 1919.	Total Outputs. Jan.-Oct., 1919.
Vryheid, 30,391 tons	271,848
Dundee, 24,999 tons	252,090
Enyati, 22,786 tons	160,736
Natal Navigation, 22,327 tons	200,772
Durban Navigation, 20,832 tons	177,983
Tendega, 11,024 tons	100,672
Northern N.N.C., 10,263 tons	88,787
Cambrian, 8,483 tons	83,429
Buffalo, 8,615 tons	41,286
Utrecht, 9,550 tons	89,016
Glencoe, 9,161 tons	81,536
Wallsend, 8,721 tons	78,123
Natal Steam, 8,724 tons	77,635
Newcastle, 5,820 tons	54,911
Elandslaagte, 5,286 tons	47,050
Bernica, 2,732 tons	22,986
Dewars, 1,433 tons	10,878
S.A.C., 12,752 tons	89,897
Natal Ammonium, 5,992 tons	40,529
Ballengeich, 8,458	83,600
Avon, 1,080 tons	8,807

II.—Present Production and Future Prospects.

COALING CAPACITY AT DURBAN—DELAYS CAUSE BITTER DISAPPOINTMENT—THE TRUCK SHORTAGE QUESTION—DEVIATIONS ON THE RAILWAY MAY HELP—TOYING WITH A GREAT INDUSTRY—LACK OF AGREEMENT AMONGST COAL OWNERS.

WAR conditions have been responsible both for a large increase in the Natal coal output and for a subsequent curtailment of production. The declaration of the Suez Canal zone as a theatre of war and the deflection to the Cape route of shipping bound to and from the East and Australasia was one big factor in the development of Durban as a coaling port. Australian convoys have constituted a big class of customers, and the generous patronage of the Admiralty has also provided a large market but latterly the coal output of Natal has been curtailed by insufficiency of rolling stock on the South African Railways and also by the disastrous effects of the influenza epidemic. Truck shortage has always restricted the production, but latterly this handicap has been more marked than ever. There is no diminution of demand by shipowners. Steamers are frequently delayed at Durban for days, sometimes for weeks, because the Railway and Harbour authorities are unable to fill bunkers. Only the other day the demands of shipping in the port amounted to 46,000 tons and only a small portion of these requirements could be delivered. The plain truth is that the port is being starved for coal, and some shipowners and colliery directors fear that the present delays in coaling may result in shipping fighting shy of Durban. The Railway and Harbours Administration are doing their best to cope with the traffic. Deviations on the main line are being effected and should result in quicker runs from the coal fields to the coast, but no very appreciable measure of relief can be looked for until a large proportion of the new rolling and loco. stock on order is delivered and is in commission. Simultaneously there will have to be increases in the coaling installations at the Bluff. The present arrangements there, though good in their way, will be wholly insufficient to bunker ships and load coal for the export trade when the Railways are in a position to deliver coal in quantities more closely approaching to shipping requirements. Durban, by virtue of its geographical position both in regard to the Natal and Zululand coal fields and also in regard to ocean routes, and particularly the Eastern routes, is destined to become by far and away the most important coaling port in the Southern Hemisphere. If it does not achieve this the Union's Departments of Railways and Harbours and the colliery companies themselves will merit severe censure, for all the factors necessary for the building up to a really large bunker and export trade are in existence there—cheap coal at no great distance from the coast, a magnificent harbour wherein the largest ships afloat could be berthed, and a most favoured position in regard to the Eastern and South American markets. But so far Natal has never yet produced anything approaching its coal outputting capacities. The record year's output (2,757,678 tons in 1916) could be greatly improved on almost immediately, provided adequate trucks and labour were available. It is somewhat surprising to find that even to-day one-third of the coal handled at the port is delivered to ships by such primitive methods as basket-carrying, and the bin at the Point which has 10,000 tons' capacity is quite unworthy of the premier coaling port of the Union. The transporters at the Bluff, too, are insufficient. One can foresee the day—and it is not far distant—when Durban will require a storage capacity of 100,000 tons, or even a quarter of a million tons of coal, and mechanical devices sufficient to handle at least 50,000 tons a day. At present the coal trade is being merely toyed with, and masters of ships after waiting in Durban for days for coal which does not materialise express bitter disappointment at the delays. It cannot be too strongly urged that the future of Natal coal is wholly wrapped up in the export and bunkering trades. The demands within the Colony itself are not great. There are no large power projects or miles of gold mines continually requiring fuel as there are in the Transvaal. For this reason it is highly essential that Natal should foster and build up

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her overseas coal trade; she can never hope to compete with the Transvaal for the gold industry's custom. But the markets of the Southern Hemisphere lie at Natal's feet if only the Government will help her to capture them and if too the colliery companies will only come to some practical working agreement amongst themselves and not dissipate their energies in endless bickerings and destructive rivalry. Your Special Commissioner has been at great pains to understand thoroughly the present position and future prospects of the Natal coal trade, and he has been greatly interested in the various arguments put forward by those who stand for pooling of output and those who are opposed to it. It appears to your Commissioner that the Natal Coalowners' Association exists only in name; there is no unanimity of policy such as is secured by the Transvaal Coalowners' Association. This perhaps is not to be wondered at when one considers that Natal coals are less uniform in composition and in calorific values than Transvaal and Free State coals and that the seams are of more varying widths. Some colliery owners are all in favour of pooling and grading, and in this attitude they are supported by the Railways and Harbours Administration. Other companies submit that it is an unfair handicap to have to mix their coals with products of inferior value. One gentleman representing large coal and shipping interests informed me the other day that he had to put the products of 19 different collieries into the bunkers of one ship. There is, of course, much to be said for and against each side of the question, but it seems very clear that until these opposite views can become reconciled Natal coal will always labour under a very severe handicap in regard to the marketing of the product.

Coal in Trucks at Durban Harbour.

III.—Coal Facilities at Durban.

A Detailed Description of the Bluff Installation Coping with the Increased Coal Trade Facts and Figures about the Port.

The development of the Natal coal industry and particularly the expansion of the export and bunkering trades at Durban has called for improved coaling facilities at that port. The equipment existing there to-day has a maximum capacity of about 1,400 tons per hour, but when the railways are in a position to deliver more coal and satisfy the demands of shipping the present equipment will require considerable extension. Natal, which has the premier port of the Union, was the first of the South African states to discover coal (in 1838), and mining commenced in 1888. The Cape Colony commenced mining in 1865, the output then being 16,500 tons, which amount had increased in 1899 to 208,655 tons. The Cape Colony's output after that date has been comparatively insignificant as compared with that of Natal and the Transvaal, which latter commenced mining in 1893. The development of the coal industry has been and will continue to be most beneficial to Natal, as it will result in largely increasing traffic to the coast. Railway facilities to-day are much improved since the early days of the coal traffic, but there is a great dearth of rolling stock. In 1907 it took 90 hours for the coal to travel from the mines to the harbour, and to-day—with a greatly increased load—it can be conveyed in 70 hours. The importance of the coaling industry has never yet been fully and generally realised in South Africa, and the output has been greatly curtailed by lack of rolling stock on the railways. The advantages of having large supplies of coal available at Durban have been especially brought home during the War, but for various reasons the Port of Natal has never yet been able to reap the full benefit of its favoured situation in regard to its large up-country coal areas. Nevertheless, the progress of the port of Durban since the days of the Boer War has been most gratifying. In those days mail steamers and smaller craft lay outside the harbour, and cargo and passengers were unloaded thence into tugs and lighters. Now, the mail steamers and larger vessels come inside and are unloaded alongside the wharf.

This enormous advance may be attributed partly to the great increase in the coal industry at the port. About the year 1905 it was found that the old methods of coaling, by means of baskets, were altogether inadequate; designs were therefore got out for a coaling plant, which was erected in 1907, and this plant has done excellent service during the last ten years. Before the erection of this first coal loading plant the coal loaded annually at Durban amounted to 847,000 tons, but in ten years it had risen to more than double that amount. In 1913 it was decided that a new coaling plant was necessary, partly as an extension, and partly to take the place of the old one, should anything go

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wrong with it. Messrs. Fraser & Chalmers secured the contract for this new plant, and it was to have been erected in 1915, but, owing to the outbreak of war, and to Messrs. Fraser & Chalmers' premises being requisitioned by the Government, that was rendered impossible. In 1917, however, the plant was completed, and Messrs. Fraser & Chalmers are to be congratulated upon the excellent work achieved by this equipment. Through the courtesy of the local administration of the S.A. Railways and Harbours, your Special Commissioner was enabled to make an inspection of the coaling installation the other day, and the following descriptions of the plant should prove of interest. Generally speaking, the installations consist of four essential units: (a) The dumper, with which the coal trucks are discharged into a large concentrating pan. (b) An inclined belt conveyor, which receives the coal from this pan and elevates it up an incline to (c), a second band conveyor, which runs in an elevated gantry parallel to the quay-wall and which feeds, by means of a tripper, on to (d) a hinged telescopic band conveyor, which is mounted on a travelling tower and can be fed with coal in whatever position it may be, and discharge into the vessel.

Coaling by Hand at the Port

(a) The Dumper is one of McMyler's well-known machines designed to handle 75-ton trucks (short tons), and to discharge them by tipping them over sideways into the large concentrating pan. The Dumper is controlled by three 150 h.p. Westinghouse motors, with the latest pattern contact or control gear. It is necessary to raise the coal at this point, not only because it was undesirable to excavate so near the water, but also in order to be able to feed from the concentrating pan to the existing coal handling plant, and to provide the necessary energy for disposing of the empty trucks by gravity; to this end the rail level of the tippler is about 12 feet above ground-level. The coal trucks are pushed up a ramp by means of a "pig." The normal position of this "pig" when not in use is in a pit between the rails of the track on which the coal arrives, so that the trucks can pass over it. The full trucks gravitate to a point just beyond, and there come to a standstill, at the foot of the ramp, from which point they are handled by the "pig," which emerges from the pit and engages with the central buffer at the rear of the truck and pushes the latter up to the dumper. Immediately the truck arrives at the dumping platform the "pig" returns by gravity into its original position in the pit, ready for the next truck. After the coal has been tipped the now empty trucks run by gravity down the incline on the other side, to the sorting sidings. The dumper is capable of dealing with any size wagon up to 75 tons capacity, or it will accommodate two smaller ones at the same time equally well. The capacity has been kept on the high side in order to allow for delays which occasionally occur in the handling and marshalling of the trucks, and to bridge over such gaps in the continuity of the proceedings sufficient storage-room is allowed in the concentrating pan for about 150 tons of coal. The handling of the trucks does not therefore have to stop when the conveyor is held up for a few minutes when changing holds, or for other causes. In a lay-out of this kind it has been necessary to very carefully consider the sidings, so that the full trucks can be easily fed down to the tippler or dumper, and then led away to the empty sidings. The concentrating pan into which the coal is tipped is so arranged that it may either feed on to the inclined belt or into tubs standing on trucks which are running on the bucket car line, underneath the concentrating pan. These tubs are of special construction to be handled by an existing coaling plant, and consist of skips holding about 7 tons to 8 tons of coal. Six of these can be automatically and simultaneously filled by means of valves which have been arranged at the six corresponding outlets from the concentrating pan. These valves are all opened simultaneously by a motor, and the coal is allowed to flow until the trucks are full, when all valves are again closed by the motor, being so arranged that they cannot overfill the skips. When the coal is fed on to the conveyor this is done without the employment of any of the usual feeding devices, as Messrs. Fraser & Chalmers have found, from experience gained with other plants, that a properly designed feeding shoot will feed the coal sweetly down to the belt without overloading it, and without any necessity for an automatic feeder of any kind.

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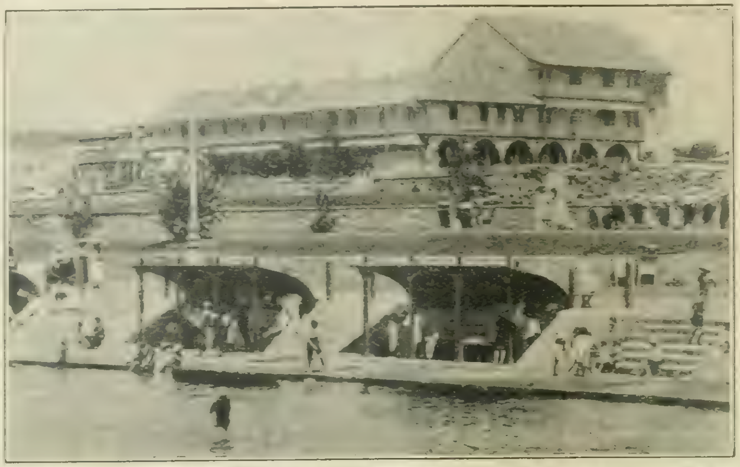

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(b) The Inclined Belt, known as conveyor No. 1, which is about 230 feet long, from centre to centre of terminals, and 48 inches wide, takes the coal from the concentrating pan to an intermediate tower, up an incline of 20 degrees. It is carried on a bridge entirely enclosed and provided with a footwalk on each side of the belt, the driving gear being at the head end, and a 65-h.p. motor is provided for this. A set of troughing and return idlers is used for these band conveyors; they are fitted with ball bearings throughout. The belt itself is a 10-ply composite rubber-canvas one, with 3-16 inch thickness of pure rubber on the working side. At the intermediate tower the coal is discharged into a three-way shoot, from which it can—by manipulation of the valves—be fed either direct to the travelling tower, if it should happen to stand in this position, or to conveyor No. 2, which runs parallel to the quay-front, while a third outlet is provided in order that the coal may be fed to a similar conveyor, the erection of which is contemplated as a future extension, and which is to run to the opposite side to the one already in use.

(c) The Tripper Conveyor, running along parallel to the quay-wall, is known as conveyor No. 2, and is provided with a tripper, through which it discharges the coal to the receiving hopper of the travelling tower in whichever position the latter may be. The tripper conveyor is about 525 feet long, and also 48 inches wide, and is driven at the head-end by another 65-h.p. motor. If the tripper has to be moved to a fresh position it can be travelled along the bridge or gantry by the conveyor belt itself, but in addition to this it is also provided with an auxiliary hand-travelling gear, so that it can be moved if the belt is not running. One feature of the tripper is that it is automatically locked during the time it is discharging coal. The upper part of the gantry forming the protection for the tripper belt is, on the side next the tower, only closed in for a portion of its depth below the roof, the lower part forming a slot-like opening interrupted only by the stanchions by which the roof is supported.

A Bird's Eye View of Durban Harbour.

(d) The Travelling Tower. The principal object of this is to support a telescopic hinged belt conveyor which has a wide range of movement. The shortest length of the band from the supporting trunnion to the centre of the head pulley is 55 feet, and when racked out to the uttermost it is 77 feet. The conveyor is capable of discharging coal at a maximum height of 50 feet above the quay level, or a total height of 60 feet above the water line. It can also be adapted, by its telescopic movement, to deliver at a distance varying from 8 feet to 30 feet from the edge of the quay-wall, so that it is capable of coaling any size of vessel calling at the port. This great flexibility, which is a special feature, is obtained by making the conveyor both luffing and telescopic, so that by a combination of these two facilities the discharging terminal can be placed in any position required within the limits mentioned. The conveyor can either feed direct into the ship or can discharge by way of the telescopic anti-breakage shoot which is provided, and which is supported by the large box-lattice shear-legs which form a part of the tower. The shoot is lowered into the hold of the vessel until the lower end reaches to the bottom, the coal is then fed in at the top until the shoot is full, when the shoot is gradually raised to allow the coal in it to pass out at the same rate at which it is fed in at the top of the conveyor; in this way the coal can be lowered without a drop, whereby breakage is avoided. It may be mentioned that as the South African coal is particularly friable, special care was taken in the construction of this plant to eliminate any undue breakage of the coal by avoiding as much as possible any direct fall at the points of transference. The whole tower, which weighs approximately 150 tons, is arranged to travel along the quay front on two double rail tracks, 43 feet, 6 inches apart, at the rate of 80 feet per minute, and the telescopic and luffing motion of the conveyor and the telescopic and luffing motion of the anti-breakage shoot are so arranged that they can be operated in a minimum of time, so that it is possible, for instance, for the man in charge, after completing coaling at one hold, to withdraw the shoot and conveyor and move the whole apparatus along to the new position, and start coaling again at the next hold with a waste of time of only about 2½ minutes to 3 minutes. These quick movements are only possible because the whole plant is controlled by one man, who has his stand in the cabin at the top of the travelling tower, from which point of vantage he can closely watch and adjust all operations. All the master controllers which operate the two main belts, Nos. 1 and 2, and the telescopic belt, are placed in this cabin, as well as those of the luffing and telescopic motions of the belt conveyor, and the anti-breakage shoot in the tower, and all movements of the tower itself. As this one man has all these motions under his control, he is able to combine them in such a way that no time is lost and that accidents are extremely unlikely. All motions on the tower are controlled by seven electric motors. These include: traversing motor, 80-h.p.; conveyor drive motor, 80-h.p.; conveyor telescoping motor, 10-h.p.; conveyor luffing motor, 40-h.p.; shoot telescoping

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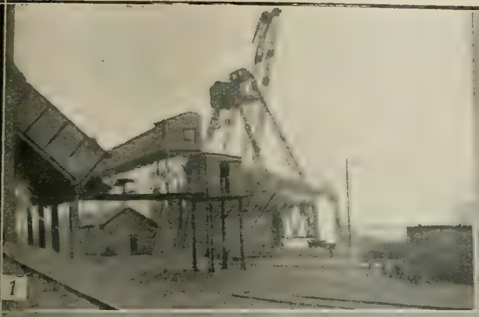

(1) Coaling a Ship at the Bluff.
(2) Steamers in Durban Harbour awaiting coal, October [illegible]
(3) General view of the Mechanical Coaling Plant, Durban.
(4) Coaling an Eastern Bound Ship.
(5) Another View of the Plant at Work.
(6) Coal Transport and Bin at the Bluff, Durban.
(7) A Coal Train at the Bluff.
(8) Coaling a Steamer bound for Singapore at Durban.
(9) The Storage Bin at the Bluff, capacity [illegible] tons of coal.

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motor, 6-h.p.; shoot hoisting motor, 25-h.p.; jib luffing motor, 40-h.p. With this method of driving all telephones and signal-belts, etc., which play an important part in some older installations, can be entirely dispensed with. The coal-dumping plant is also under the control of one man, so that these two drivers are the only two skilled men that it is necessary to have about the place. As far as the dumper is concerned, all that the driver has to do is to keep a constant supply of coal in the pan, and there is no need for any form of signalling, with its inherent dangers, throughout the plant. All movements are provided with automatic cut-outs, so that the whole plant stops the moment anything goes wrong. In addition to this provision, there are emergency push-button cut-outs arranged at intervals along all gantries or bridges, and at different points on the tower, so that if an accident should occur through any cause the whole plant can be immediately stopped by the use of any one of these push-buttons. This special feature in the complete electrical control of the plant is one of the chief developments in this latest coaling installation, as it not only reduces the running of an otherwise complicated plant to a very simple business, but it also saves labour expenses, which matter is equally essential to the commercial success of the plant. The requirements laid down by the South African Government were that the plant should be capable of loading coal on board at any rate of speed between 200 tons and 600 tons per hour, but it is actually capable of dealing with 200 to 1,000 tons per hour as a normal load, and if at all pushed, can easily carry more than the 1,000 tons, provided external conditions are favourable, such, for instance, as the supply of trucks in quick succession and the necessary trimming of the vessel. The rate of travel of the belt when dealing with 200 tons per hour is 120 feet per minute, and when dealing with 1,000 tons it is 600 feet per minute. The requirement that the tonnage carried over the belt should be varied was specified so that the coal should be fed at a low speed when discharging to side or head ports, and at the maximum speed, if desirable, when loading into open hatches, or at any speed between the minimum and maximum limit at the discretion of the driver on the tower, who can see exactly how much coal can be taken, and increase or decrease the speed at which it is fed to the boat according to circumstances. These requirements were happily met by varying the speed of the conveyor belts, instead of depending on the opening or shutting of regulating valves, which could not well be controlled from a central point, and would therefore necessitate the employment of additional labour, signalling, and other complications. The plan adopted also allows the belt to run at its full load all the while, whatever the capacity of the plant at that particular time, which, of course, is the most economical arrangement for the life of the belt. The 500-volt direct-current electrical current is conveyed to the various motors by means of a series of trolley wires, which are attached to the structures supporting the conveyor belts, and which feed to and from the tower by trolley collectors. The whole plant can be lit up, and is therefore capable of working at night, the current for the lighting being 200 volts alternating current. The total horse-power on this plant is about 781. Great care has been taken in the design of the plant, so that any part of the machinery on the tower or elsewhere can be taken out and lowered to the ground for repairs in the shortest possible time. All winches, both for the dumper and other machinery houses, are provided with runways over them for the accommodation of blocks and tackle, which will always be available for hoisting any part of the plant from its position and lowering it on to railway trucks in case of any repairs being necessary. The telescopic shoot of the tower is also so designed that it can be placed on a railway truck running on the rails under the tower. Both the main belts are driven by single terminal driving drums, in preference to the tandem driving pulleys favoured by some engineers, and the peculiar arrangement of the idlers of the return band close to the driving terminal will give to the drum the necessary grip on the band without its being necessary to employ these so-called tandem driving pulleys. The coal, as it passes over the main tripper belt, No. 2, is automatically weighed by a Merrick weighing machine, so that an accurate account can be kept of the amount of coal loaded. The plant was designed and manufactured at the Erith Works of Messrs. Fraser & Chalmers, Ltd., and erected at Durban by one of their engineers, who went specially for the purpose to South Africa. About two-thirds of all the coal dealt with to-day at Durban is handled by this plant at the Bluff, the remainder being dealt with by the antiquated basket system at the Point.

Facts and Figures Concerning Port Natal

Ballast.—Sand ballast 2s. 6d. per ton.

Entrance.—Entrance depth on bar channel 37ft. L.W.O.S.T., and harbour channel 31ft. Vessels can now enter and leave the port freely (drawing 30/31 feet). The record draught of any vessel entering is 32 ft. 4 in., viz.:—s.s. Strombus, which left this port on the 20th November, 1909, and the largest steamer the s.s. Caronia, 19,687 tons gross. Length 650 feet, draught 32 feet 2 inches.

Coal Tip.—To load 400 tons per hour, is in working order.

Coaling.—At the tips costs 1s. 6d. per ton for coal loaded into bunkers and 1s. per ton for coal loaded into holds, inclusive of trimming. Coaling by hand costs 1s. 3d. for day work and 1s. 9d. for day and night.

Floating Dock Charges.—A new floating dock, 475 feet in length, 70 feet in depth, with a lifting capacity of 8,500 tons is available. The largest steamer lifted, s.s. Maine, 7,914 tons, 491 feet x 58 feet 2 inches:—(a) for the first 24 hours, or part thereof, including docking, first 1,000 tons, or any portion, 6d. per gross registered ton. Next 1,000 tons, 5d. per gross registered ton. Balance (over 2,000 tons) 3d per gross registered ton. Minimum charge for the first 24 hours, £12. (b) For each subsequent 24 hours, or part thereof, 3d. per gross registered ton. Minimum charge for each subsequent 24 hours, or part thereof, £2. (c) Vessels using the dock beyond 4 days shall be charged 20 per cent. extra on the charge for such long period.

Graving Dock.—A new graving dock is being commenced, of about the following dimensions:—Length, 1,000 feet; width, 110 feet; depth at low water, 35 feet. The dock will be capable of being subdivided into two sections.

Harbour Dues. Inclusive of pilotage, for each registered ton up to 3,000 tons, 6d. per ton, and for each ton exceeding 3,000 tons up to net register tonnage, 2d. per ton, for periods up to and including ten days, and for each day thereafter one-tenth of dues as above specified, plus 25 per cent. Fifty per cent. less than above charge for ships calling for bunker or cargo coal, or alternatively 6d. per ton on the quantity of coal shipped up to 1,000 tons, and 3d. per ton over first 1,000 tons, plus the above 25 per cent. Ships calling off the port for orders pay light dues only. Vessels calling for bunkers only may ship up to 50 tons of cargo without incurring any extra dues whatsoever.

Light Dues.—First 500 tons 2d., the balance over 500 tons 1d. per net register. Vessels calling for bunker or cargo coal are emempt from light dues.

Stevedoring.—General cargo, 8d. per 20 cwt. or 40 c ft. Grain, 8d. per 40 c. ft.

Shifting.—With own steam, £4 7s. 6d. Without steam, £6 5s.

Water.— 7s. 6d. per 1,000 gallons with discount from 2½ to 15 per cent., according to quantity taken above 10,000 gallons.

Wharfage.—There is 4,860 feet available, giving 21 ft. to 24 ft., 1,050 feet giving 25 feet, 900 feet giving 27 feet, 1,757 feet giving 30 feet, 1,660 feet giving 34½ feet, and 710 feet giving 38½ feet, all at L.W.O.S.T., 2,660 feet at Congella giving 25 feet.

Cranes.—Electric, 11 of 3 tons; hydraulic, 29 of 3 tons, 1 of 10 tons, 1 of 50 tons; shed cranes, 17 of 30 cwt.; steam cranes 4 of 10 tons; capstans, 16.

Sheds.—Cargo capacity approximately 50,000 tons. Coaling appliances capable of loading 760 tons per hour, and facilities adequate to ship 12,000 tons coal per day.

Steamers arrived and berthed during year 1919, 922; registered net tonnage, 2,257,660 tons, gross tonnage, 3,513,986 tons.

Cargo landed during same period, inclusive, 640,151 tons.

Cargo shipped during same period, 766,243 tons

Total cargo landed, shipped and transhipped, 2,415,110.

Coal bunkered, 675,160 tons; coal exported, 664,780 tons.

Telegraphic Address :
"SHIPMENTS."

Phones : 1, 1965, 2322, 2460.

CODES : A.B.C. 5th, Bentley's, Broomhall's Imperial, Lieber's 5 letter, W.U. National, W.U. 5 letter and Private Codes.

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THE COAL MINES OF NATAL.

THE DURBAN NAVIGATION COLLIERIES, LIMITED.

A MAGNIFICENTLY EQUIPPED PROPERTY.—TWO COLLIERIES AT WORK.—DEVELOPMENT OF THIRD COLLIERY CONTEMPLATED.

This is one of the most important and progressive coal companies in Natal, and owns extensive coal bearing areas close to Dannhauser Station, on the main line.

The directors of the company are Sir Owen Philipps, G.C.M.G., M.P. (chairman), E. W. Janson (vice-chairman), W. Holford Dixon, F. W. Lund (managing director). Messrs. Percy Tarbutt & Co. are the company's consulting engineers, and the offices are at 281 Gracechurch Street, London, E.C. 3. The issued capital of the company is £158,171 in 790,855 shares, each of 4s. nominal value.

The general characters of the coal throughout the mine are of a most favourable nature. The seam worked consists of the following:—

Top seam, 3 ft. 7 in.; stone and shale part, 18-20 ins.; bottom 5 ft. 3 in.

The depths to the seam are:—495 ft. in No. 1 workings, and 567 ft. in No. 2.

General Sample of Coal from Durban Navigation Collieries, Ltd.

By-product Analysis.

Coke, 74.4 per cent.
Tar, 9.5 per cent. equals 19 gals. per short ton
Ammonical liquors, 4.3 per cent. equals 8.6 gals. per short ton.
Gas, 11·8 per cent. equals 7,100 c. ft. per short ton.
Total—100 per cent.

Sulphur equals 1.78 per cent.
Calorific value per lb. equals 13.65 per cent.
Nitrogen, 1.52 per cent.
Eq. sulphate of ammonia, 7.15 per cent.
Eq. sulphate of ammonia, 143 lbs. per ton of coal.

The New Colliery at Durban Navigation.

The mine is worked on the pillar and stall system, and the general layout of the underground workings both as regards ability to handle a large tonnage economically and efficiently, and also in respect of ventilation is wholly admirable.

The Oct. 1919 output of the company was 21,000 tons, of which 17,000 tons were drawn from No. 1 workings, and 4,000 tons from No. 2 workings.

The following recent analyses of the product of this company will give a good idea of the class of coal worked:

Analyses by Mr. S. B. Bilbrough

Bulk sample from both collieries.

	No. 1 Col.	No. 2 Col.
Moisture	1.6	1.55
Vol. matter	27.10	30.35
Fixed carbon	60.05	58.7
Ash	11.25	9.4
Cal. value	13.4	13.84
Sulphur	1.51	1.26

The proximate analysis you already have, a sample of coke has been sent to you per passenger train.

The distillation of the coal was carried out in a cast-iron retort filled three-fourths with coal and distilled at full red heat. The tar recovered was black, and heavier than water. The coal was a very strongly coking one, and swelled very strongly. The sample of coke sent you contains one or two bits taken from the top of the retort and illustrates the great swelling of the coke.

The coal undoubtedly would make an excellent coke.

The recovery of tar is very large indeed.

The ammonia content is normally high.

A closed retort coke oven should yield about 80 per cent. of the tar and about 20 to 25 per cent. of the ammonia represented by the above figures.

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Anvils, Alarms, Bolts and Nuts, Blocks (Plummer), Blocks (Lifting & Pulley), Braces, Bolt Cutters, Blacksmith Outfits, Couplings and Collars, Chasers, Chisels, Cocks (All Kinds), Cramps, Cotter Pins, Drills, Expanders, Ejectors, Fans, Forges, Files Gauges, Gauze, Governors, Hammers, Handles, Letters, Injectors, Indicators, Jacks, Levels, LUBRICATORS, Metal (Babbits, Magnolia, etc.), Meters, Muffels, Nuts, Pipe Cutters, Pumps, Punching Bears, Pulleys, Rollers, Rivets, Regulators, Reamers, Shafting, Saws, Stocks and Dies, Spanners, SPIKES, Snaps, Traps, T. Irons, Truck Pushers, Unions, VALVES (All Kinds), Taps, Vices, Wrenches, Whistles, &c.

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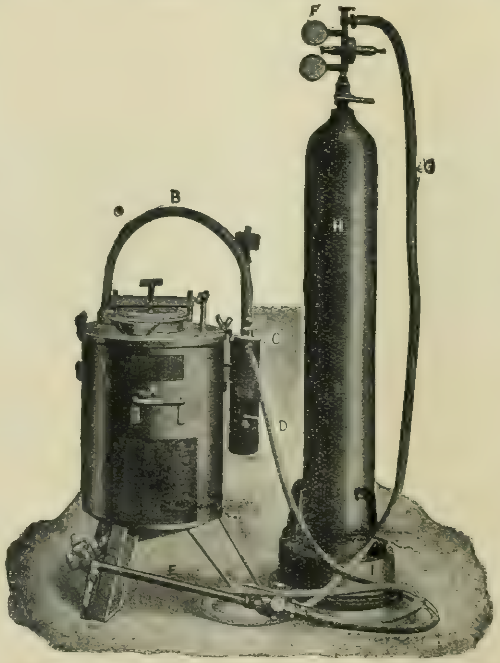

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ALL PLANTS ARE MADE TO THE BRITISH ACETYLENE & WELDING ASSOCIATION STANDARD.

If the coke were to be further treated in Mond Gas Producers the yield of sulphate of ammonia would be about 75 per cent. Gas producers, however, presuppose a large power station, and closed retort ovens presuppose a large market for coke.

Your coal is undoubtedly one of the best coking and tar producing coals in the country, and from a scientific point of view should not be wasted as steam coal.

The benzine yield would be about 1 to 2 per cent. of the tar.

The primary products of a coal are (1) power, and (2) coke, and unless the market for either of these two primary products is assured, it is useless to reckon anything for by-products.

The last accounts issued show that this company is in a strong financial position.

The total area controlled by this company is 16,000 acres, a substantial percentage of which is coal-bearing. The No. 1 pit workings of the company are equipped for an output of 40,000 tons per month, and the No. 2 colliery has been laid out on the basis of an output of 25,000 tons per month. Such production is, however, out of the question until more trucks are available to transport coal to the coast. Durban Navigation is, therefore, to be regarded as one of the very largest potential producers in the country. The development of a third colliery west of the No. 2 pit is in contemplation within the next few years, and when this is equipped, the Durban Navigation Co. may be in a position to produce more coal than any other single enterprise in South Africa. The mine buildings are of good red brick made on the property, plant foundations are of the same solid character; the equipments are all well maintained, and of efficient type, and the general lay-out of the company's pits, both above and below ground is excellent. The company has embarked on an ambitious policy and under the capable direction of Mr. George Sneddon, the company's general manager, a highly successful career appears to be assured.

At the time of writing the company employs 80 Europeans.

Durban Navigation: Brick housed Equipment

Durban Navigation: General Offices and Equipment at the No. 1 Colliery

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Balata "Chonata" Brand.

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Telegrams: "Chonata."

Another View of the Equipment at the New Colliery, Durban Navigation.

WALLSEND NATAL COLLIERIES, LIMITED.

Head Office: Baltic Exchange Buildings, 21 Bury Street, London.

South African Head Office: 84 Club Arcade, Durban.

Capetown Office: Markham's Buildings, Capetown.

This company supplies South African Government, British Admiralty, Clan Line, Ltd., Messrs. A. Weir & Co.

Codes: Scott's 10th Edition, A.B.C. 5th Edition. Cables and telegraphic address, Wall Coal Co.

The mine is situated twelve miles from Dundee, and is about 250 miles from Durban. The mine has been newly equipped with modern machinery to deal with all classes of coal, and is now developed to do 20,000 tons per month.

Directors: Richard Tilden Smith, Esq. (Chairman), Thomas Madsen Mygdal, Esq., Lord Inverforth, William Weir, Esq.

Auditors: Williamson, Milne & Co. (London); G. Mackeurtan (South Africa).

General Manager, Robert Mackenzie, Esq.

A General View of the Wallsend Property.

Wallsend Collieries: The Main Workings.

A Coal Train at Wallsend.

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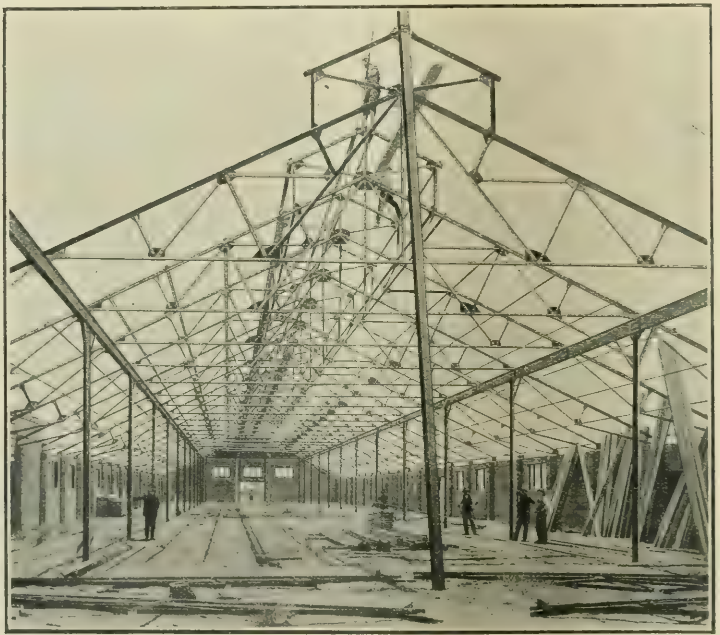

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217, MAIN STREET.
P.O. Box 2997. Telegrams : " JOISTS."

NEWCASTLE COLLIERY.

LARGE FREEHOLD ASSETS—A WELL-LAID-OUT PLANT.

Capital, £50,000 in £1 shares, all issued and fully paid.

Board of Directors: J. G. Kemp (chairman), Thomas Breary (managing director), F. G. Butcher, Dr. J. A. Nolan, John Stanton.

Office: Newcastle, Natal. Secretary, H. C. Bailey.

This company's colliery is situated on the Newcastle town lands, and the main workings are about five miles distant from Newcastle. The colliery is connected up with the main Johannesburg-Durban railway by a branch line. The main haulage shaft (depicted in the accompanying photograph) is 77 feet deep. There are two seams of coal each approximately 5 ft. 8 in. in width, and separated by a broad band of sandstone. The basin of the seam is below the bed of the Ingagane River, and the conditions are very favourable for cheap working. The lower seam, which has an excellent roof, has been worked much more extensively than the top seam. This bottom seam contains in its middle portion a most valuable band of first class smelter coal, which finds a ready market in the smelting works of the Rand Mines. The plant is well laid out, compact and efficient, and has a capacity of 10,000 tons per month. On account of truck shortage, however, this production is not at present being maintained, although it very easily could be if trucks were forthcoming in sufficient numbers. The present output averages between five and six thousand tons a month, and the total production of the colliery to date has been close on one and a third million tons. The mine is free from gas, and leaves nothing to be desired in regard to ventilation. The colliery is equipped underground with electrically operated Sullivan coal cutting machines. The coal after leaving the picking belts is fed direct into railway trucks. The life of the existing colliery on the basis of the present output is about 16 years. The company has, however, secured a large coal bearing area, which extends almost to Cavan Station on the Utrecht railway, and a new colliery will be opened up there.

THE NEWCASTLE COLLIERY COMPANY'S WORKINGS.

A TRAINLOAD OF NEWCASTLE COAL.

Boring operations are proceeding on the company's freehold farms, and the results are understood to be most encouraging.

Property.—The company's freehold property, consisting of the farms Brakfontein, Dartry, One Tree, Tendega, and Breary, remains unchanged. The total area is 8,010 acres in freehold. As reported at the last annual meeting, tree-planting on these farms has been commenced, and will be continued year by year. Farming on "Brakfontein" was again undertaken during the year, but, owing to the unfavourable season and caterpillars, the result was a loss, which is reflected in the reduced returns from sundry revenue. Boring operations on the farms were commenced in March.

Mine.—The output for the year was 66,840 tons (2,240 lbs.), being a decrease of 13,902 tons on the previous year. This small output is due to the shortage of railway trucks, which is becoming more acute. The first cases of Spanish influenza on the mine were reported on the 1st October, 1918, and the epidemic lasted throughout the month. Only two deaths resulted.

Plant.—Four new electrically operated Sullivan C.E. 7 coal cutting machines arrived in March, and have been put into service, but the shortage of railway trucks has prevented our taking advantage of our increased output capacity.

Accounts.—The sum of £4,485 18s. 11d. has been written off capital accounts for depreciation, and a credit balance of £16,924 18s. 7d. is carried forward. The cash reserve on fixed deposit remains unaltered at £7,500, with the investment of £2,500 in the Union Loan, 1921-36. Current insurances have been allowed to lapse and the company will, in future, undertake its own insurance.

Dividends.—Dividends No. 39 of 4 per cent. and No. 40 of 5 per cent. have been declared during the year.

The coal analysis of this company is as follows:—

Moisture	3.35
Volatile matter	29.00
Fixed carbon	56.63
Sulphur	1.43
Ash	10.08
Evaporative power	13.98

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Coaling Plant manufactured in Durban and erected at Cato Ridge for the South African Railways by

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Head Office and Works: CONGELLA WHARF, DURBAN.
Box No. 301. Telegrams: Girders." Telephone No. 872.

Johannesburg Office: ROYAL CHAMBERS, SIMMONDS STREET.
Box No. 1663. Telegrams: "Steelwork."

Cepetown Agents: R. B. HENDRY & CO., Box 1117, CAPETOWN.

NATAL STEAM COAL COMPANY

A WESSELS NEK ENTERPRISE. —THREE DISTINCT COAL SEAMS. —SATISFACTORY STEAMING TESTS.

Directors: Sir David Harris, K.C.M.G., M.L.A. (Chairman), James Henderson, Esq., M.L.A., David Calder, Esq., J.P., David Citroen, Esq. (London).

Head Office: 12 Club Arcade, Smith Street, Durban. Business Manager and Secretary, Edmund H. Toulson. Mine Manager, Frank S. Hatton. Capital, £50,000.

The mine is situated on the farm "Steinkol Spruit," near Wessels Nek Station, and the company owns coal-mining rights on farms "Doone" and "Steinkol Spruit." Three distinct coal seams have been proved on the property, of which the top seam is the only one being worked at present. The last analysis from this seam, taken in September, 1919, is as follows:—

Moisture, 1.20; volatile matter, 18.50; fixed carbon, 70.70; ash, 9.60—Total, 100 per cent. Evaporative power, 14.00 lbs.

A steaming test made by the South African Railways on May 31st, 1919, over their usual testing section, Ladysmith to Mooi River, gave the following results:

Consumption, 113.28 lbs. per mile.

Evaporation, 8.36 lbs. water per lb. coal.

Remarks: "This coal made little porous clinker, which gave no trouble, the fire was cleaned once on the journey."

Outputs: 1913, 56,834 tons; 1914, 54,177 tons; 1915, 75,965 tons; 1916, 90,534 tons; 1917, 106,670 tons; 1918, 113,796 tons.

The present workings lie at a depth of 400 feet from the surface. The coal is worked by the "double stall" method, the usual width of the stalls being 40 feet, pillars varying in proportion to the depth. The mine is a non-fiery one, and ventilation is effected by means of a "Sirocco" exhaust fan. "Sullivan" electric coal cutters are used to undercut the coal, and are of their usual "Ironclad" type, 35 h.p. The life of the mine is estimated at 21 years. Recent dividends have been:—1916, 10 per cent.; 1917, 10 per cent.; 1918, 6 per cent.

THE GLENCOE (NATAL) COLLIERIES, LTD.

A HIGH GRADE COLLIERY.—BETTER OUTPUTS IN THE NEAR FUTURE.

Capital, £250,000, all issued. Directorate: A. Mackie Niven (chairman and managing director), Dundas Simpson, E. M. Hyman, B. W. Brayshaw, E. Mansfield. Secretary: F. J. Slaven, A.C.I.S. Manager: Thomas Parker. London Committee: W. H. Saville, N. A. Leslie, Wm. Law. London Secretary: A. Hamilton. Agents: Durban, James Wilson; London, Messrs. Mitchell Cotts & Co. Head Office: 159-160, Stock Evchange Buildings, Johannesburg, Transvaal. P.O. Box 2365. London Office: 8, St. Helen's Place, E.C.

This company's property is situated about two miles from Hatting Spruit Railway Station, with which it is connected by a branch line 3,700 yards long. Active coal winning operations were commenced shortly after the conclusion of the Boer War, and to date the total output of the Glencoe Company has amounted to about two and a third million tons. The present monthly return averages 8,000 tons, but the mine is capable of doing considerably better than this.

Glencoe Collieries—The Main Shaft

The company's product is of excellent quality, the calorific value bieng about 14.5. Glencoe coal is thus to be reckoned amongst the very best of Natal coals, and its steaming value is very little inferior to that of the best Welsh coal.

Last year the company met with misfortunes. The dip workings of the mine were flooded, and towards the end of 1918 the influenza epidemic completely disorganised the operations of the company, and the year's output sank to 86,323 tons, which is the lowest output recorded since 1904.

The company has now sunk a borehole 8 inches in diameter, which is lined with a six-inch pipe, and the water is forced to the surface with a pump situated at the bottom of the borehole. This borehole has been sunk at a point very near the deepest part of the workings, and it is considered that by this means the mine is now secured against any further serious influx of water.

The coal-cutters at this mine consist of Siskol and Sullivan punchers, and the mine is well and compactly equipped at surface around the main shaft, from which the company's present output is being obtained.

Like practically every other colliery in Natal, the operations of the Glencoe Company have been seriously handicapped by truck shortage and scarcity of native labour.

If, however, no misfortunes at present unforeseen hamper the company's operations the mine should be able materially to increase its output from the beginning of next year, and work up to a capacity approaching that attained in 1912, when an output of nearly 193,000 tons was secured. The Government Department of Mines assesses the life of the Glencoe mines at 14½ years, on a monthly output of 15,000 tons per month.

The directors' report for the year ended 31st December, 1918, stated, *inter alia*:

The company's freehold property remains unchanged, and consists of the farms "Clipsham" and "Verdruk," 1,170 acres in extent, in the Dundee District, Klip River County, Natal. In addition, there are held two claims on the farm "Droogę Ref," which adjoins the freehold farms on the West; and the lease of portions of the freehold farms "Smithfield" No. 1 and "Smithfield" No. 2, which adjoin the farms on the South.

The output totalled 86,322 tons, a decrease of 54,583 tons as compared with the previous year. Mine development has been continued where possible; the footage driven was 1,898 against 2,690 in 1917, 3,904 in 1916, and 2,595 in 1915.

The reputation which the company's coal has, as being one of the best in South Africa, has been fully maintained.

The cold storage van was in use on 152 occasions during the year, as compared with 157 in 1917, owing to the shortage of railway trucks, or owing to their irregular supply.

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BALLENGEICH COLLIERIES

A FOUR THOUSAND ACRE PROPOSITION—THE BY-PRODUCT FLOTATION.

The Ballengeich Colliery is situated near Ingagane, and is about five-eighths of a mile from Ballengeich siding, on the Natal main line between Alcock Spruit and Ingagane sidings. The area controlled by the company is about 4,000 acres, and the enterprise commenced production of marketable coal in 1907. The company, which is known as The Ballengeich Collieries, Limited, has its headquarters in London, the Board being presided over by Col. Sir Percival S. Marling, the late chairman (Sir W. H. Marling) having recently died. W. E. Hallett, Esq., is the managing director. He resides continually in England. The mine staff comprises: Mine manager, W. Nash, Esq.; mine secretary, H. J. Harrison, Esq.; mine engineer, J. T. Watts, Esq.; mine captain, W. Parry, Esq.; point manager, F. J. Afford, Esq.

Ballengeich Collieries.

The property is served by one working shaft which is 140 feet in depth; the width of the coal seam being worked is 8 ft. The product is carefully sorted in order to put a good grade of coal on the market, and 40 per cent. of what is mined is rejected.

Analyses have given:—

Moisture	1.80%
Volatile	22.74%
Fixed carbon	60.22%
Ash	15.24%

Calorific value, 12.60 lb.

The coal contains: Nitrogen, 1.2 per cent.; Sulphur, 1.26 per cent.

There is very little gas in the mine, and good ventilation is secured by means of a large Sirocco fan.

The coal seam is cut by little Hardy, Siskol and Hardyax (air driven), and by one electric machine. Recent outputs have been:

September	8,500
August	9,221
July	10,502
June	9,988

The S.A. Railways are large customers of this company. The company is equipped for an output of 20,000 tons of coal per month, that is 15,000 tons marketable coal and 5,000 tons for by-product treatment. The colliery is at present very short of coloured labour, only about 50 per cent. of the complement being available at the time of writing. At the time the Company employs 17 Europeans. In connection with the Ballengeich company it is important to note that a company styled the South African Carbide and By-Products Co., with a capital of £307,500, has just recently been floated in England for the purpose of manufacturing valuable by-products from the Ballengeich company's coal. For this purpose an area consisting of approximately 11 acres for factory buildings and 50 acres for residential quarters has been earmarked for the company's requirements. The capital of this important by-product venture is £307,500, divided into £300,000 seven per cent. cumulative participating preference shares of £1 each and 150,000 ordinary shares of 1s. each. It is the preference shares that are offered to the public, and these are entitled, after receiving a 7 per cent. dividend (free of income tax up to 6s. in the £), to participate in any surplus profits until they have received a further 7 per cent. (less tax). The company is promoted by the Chemico Electric Company for the purpose of manufacturing calcium carbide and of extracting motor spirit, tar oil, and other by-products from coal and shale at Ballengeich Collieries. The works will be built on an adjoining site, while a contract has been entered into providing for a supply of 1,000 tons per week of "fines," small coal, and "pickings." In a proposition of this sort estimates of profits are apt to be misleading, but the technical reports are favourable, and there is little doubt that the company would find a ready market for its products at good prices. The cost of the plant, including cost of erection and an allowance for contingencies, is estimated at £252,500, leaving £23,000 for working capital. The whole of the preference issue has been underwritten by the Chemico Electric Company for a commission of 5 per cent., and they also receive £17,000 in cash, in consideration of paying all other preliminary expenses, and also the right to subscribe for the ordinary shares at par.

Ballengeich Collieries: The Washing Plant.

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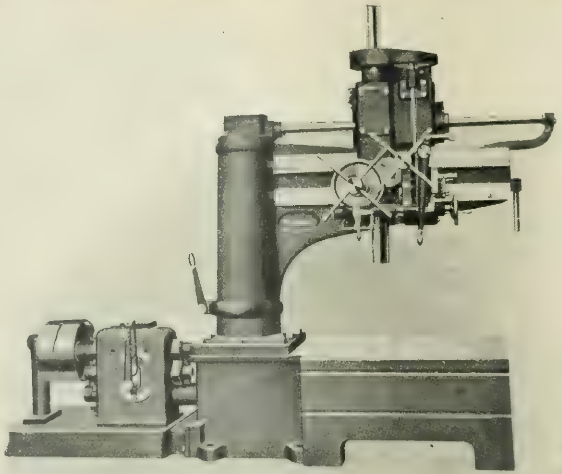

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NATAL CAMBRIAN COLLIERIES.

A LARGE DANNHAUSER PROPERTY WITH INFLUENTIAL CONNECTIONS. — THE ADMIRALTY TAKE LARGE QUANTITIES OF ITS PRODUCE.

Natal Cambrian Collieries.

Capital: Authorised, £100,000; paid up, £89,559.

Directors: Mr. Chas. G. Smith (chairman), Mr. Walter E. Butcher, Mr. H. L. Reynolds, Mr. A. Townsend, Mr. C. Whytock (managing director). Manager, Mr. A. Smith.

This company's property is distant two-and-a-half miles north-east of Dannhauser station, on the main Natal line, and is 246 miles from Durban. The company's property consists of 3,787 acres all coal bearing, and a new area adjoining the old property, which has recently been acquired. The seams are rising in every direction from the shaft's bottom, which greatly facilitates haulage and draining. Winding at one shaft only is proceeding at present. The company's capacity is 900 tons round coal per diem. The coal is very suitable for by-products, a typical organis analysis giving C 28 11. N 2.36 H5.07 O4.52. There are two washer plants, a Campbell Binny & Campbell Felspar Washer There are two shafts (upcast and downcast) which intersect the coal at a depth of 700 feet. The Cambrian is thus the deepest working colliery in Natal. There are two coal seams, but at present the top seam 5 to 6 ft. in thickness) is being worked, except in a portion where the upper seam is only 3 ft. The distance between seams is 40 to 55 feet. The bottom seam is 3 ft. 6 in. Both seams are being worked by Longwall. Coal is cut in these areas by Jeffrey's Longwall compressed air machine. Ventilation is secured by a Capel Fan, producing 200,000 cubic feet of air per minute. The average calorific value of the Cambrian coal is between 14 and 15, and a typical analysis is as under.

Moisture, 1.25 per cent.
Volatile, 20.26 per cent.
Fixed Carbon, 68.49 per cent.
Ash, 10 per cent.

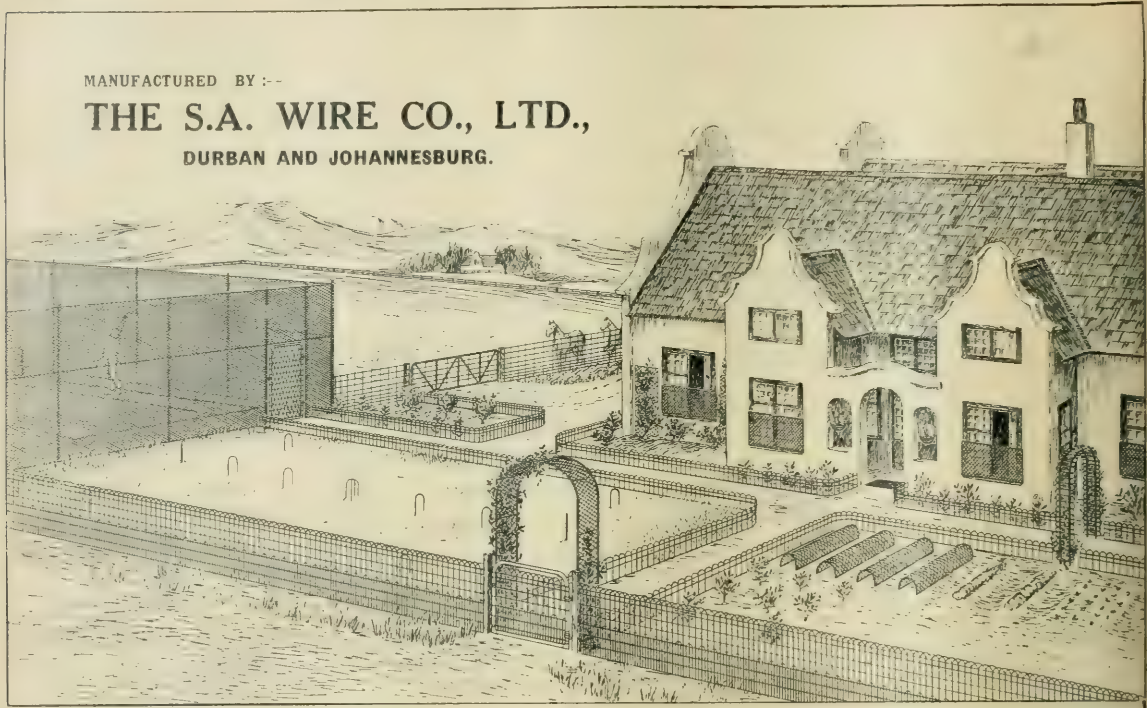
A Government analysis made in 1908 gave a calorific value of 15.52.

The product of the Natal Cambrian Collieries is a first grade Natal coal of high calorific value and small residue, as shown by the following further analysis made recently by Messrs. Bilbrough & Co., of Johannesburg. Moisture, 1.25 per cent.; volatile matter, 22.20 per cent.; fixed carbon, 68.25 per cent.; ash, 8.30 per cent. Total 100 per cent. Calorific value 14.43 lbs. of water per lb. of coal.

The coal is regularly used by the Aberdeen White Star, Clan, Orient Steam Navigation, Harrison, Swedish South African, and other leading steamship lines, and it is included among Natal coals of the first class by the Admiralty, large quantities of the coal having been taken by H.M. transports during the war. The coal also gives excellent results in sugar and other factories, in which it is very largely used, and it has been found to be very economical for household purposes as it burns well in the kitchen range, with long sustained heating power, and requires very little attention.

Power and Boiler Plant.

Natal Cambrian: The Main Workings.



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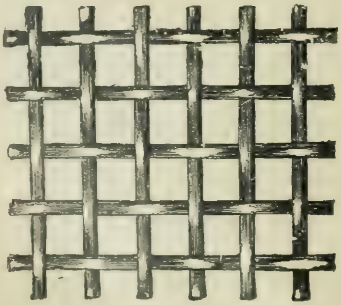

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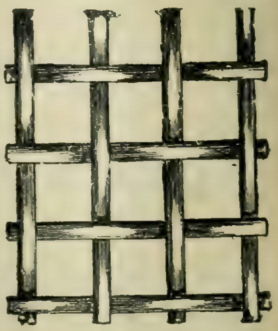

ELANDSLAAGTE COLLIERIES, LIMITED.

THE COLLIERY NEAREST THE COAST.—PRODUCT EMINENTLY SUITED FOR BY-PRODUCT ENTERPRISE.

Capital: Authorised, £175,000; issued, £165,000. Directors: J. J. Hillier (chairman), S. Mitchell, Innes, J.P., C. L. Storm. Manager: W. F. Betty. Head Office: 16, Natal Bank Buildings, West Street, Durban.

This is one of the longest established coal companies in Natal (production commenced in 1890), and is nearer the coast than any other colliery. The workings are situated at Elandslaagte Station, on the main line, and 206 miles from the port of Durban.

The area controlled by the company now amounts to close on 16,000 acres. It is proposed to undertake boring operations in the near future in order to test the value of the unworked areas.

The company is working one coal seam of approximately 4ft. width at a depth of 180 feet from surface by means of a vertical main shaft. There are in addition four other shafts on the property, and a new incline shaft is being developed, which will win coal from the newly-acquired Platberg area. Coal is being worked on the double "road stall" system. The prosperity of this company has declined considerably during the war. The output for July, 1914, was 16,650 tons. The company then had large contracts with the German East African Line. The present output is between 5,000 and 6,000 tons per month, and the output for 1918 was 63,000 tons. The issued capital is £165,000, and the last dividend paid was 6 per cent. for year ended with December, 1918. The company acquired the farm Platberg, adjoining Elandslaagte, a short while ago, and is in possession of a coal-bearing area of very large extent.

ELANDSLAAGTE COLLIERIES.

In the mine six Sullivan electric chain cutters are installed.

The storage bin at No. 5 main shaft is of 2,000 tons capacity.

The property is well equipped electrically, and has an electric locomotive as well as a steam loco, which is employed on the branch line. Ventilation is secured by a Waddell fan of 150,000 c.f.m.

There are efficient coal washing and sorting plants and picking belts, and the product from the washers is graded into two grades.

"Fines" are burned in the company's own boilers.

The following is a typical analysis of this company's coal:—Elandslaagte, No. 1 sample (calorific value lbs./lb.): 13.63 lbs./yb., 13.180 B.T.U., 7.330 calories; combustile, 15.60 lbs./lb. Proximate analysis: Moisture, 1.45 per cent.; volatile, 19 per cent.; coke or fixed carbon, 68.50 per cent.; ash, 11.05 per cent.—100 per cent. Combustible, 87.50 per cent.; sulphur, 1. 94 per cent.

In his report on this coal Mr. Sydney Bilbrough states: —Nitrogen in coal, 2.16 per cent., which is equivalent to 10.3 per cent. ammonium sulphate. That is 206 lbs. am. sulphate per ton of coal. This is an extraordinarily high value in nitrogen for a coal to give. Of course, in practice, the above theoretical amount is never actually recovered. Coking plants give about 25 per cent. and producer gas plants about 75 per cent.

In view of the high nitrogen content, this coal should be suitable for sulphate of ammonia production, and would probably be a good business proposition for by-product running in conjunction with an electric power station. As readers are aware, there is every possibility of the electrification of the railways coming about in the not far distant future, and in this connection the Elandslaagte Collieries are geographically in an excellent position. The company has a good water supply, and practically an unlimited supply of coal suitable for the production of sulphate of ammonia.

There are employed on the mine 16 whites and 100 natives, and 230 Indians. Labour is very short at present.

The bulk of the company's output in future will be drawn from the Platberg area.

The Elandslaagte Collieries are at present large suppliers to the Japanese steamship companies.

The directors' last annual report presented to the shareholders on the 11th day of March, 1919, stated: Notwithstanding the difficulty of carrying on the business of the company satisfactorily during a time of war, the statement of the income and expenditure and balance sheet for the past year show that the net profits of the company for 1918 exceed those of 1917 by £1,881 17s. 5d.

As will be seen from the appropriation account, the sum of £15,178 5s. 11d. is available for dividend purposes, after having written off £3,000 to depreciation, and making provision for all claims. This sum has been allotted as follows: —Capital redemption fund, £1,575; 6 per cent. dividend, £9,900; carried forward, £3,703 5s. 11d. £15,178 5s. 11d.

Elandslaagte and Platberg coals have maintained their high grade throughout the year. Larger shipping contracts for 1919 have been secured, and if the right kind of labour can be obtained the output will be increased. The Admiralty is taking larger quantities of our coal at an increased price. The present policy of the directors, if followed, affords still better prospects for the present year.

In view of the enormous development of research in connection with scientific utilisation of coal, it is necessary that your directors should give special attention to it, and to gather all possible information on the subject. The enhanced prosperity of the company may be found to lie very largely in the direction of by products and electricity

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THE DUNDEE COAL COMPANY, LTD.

NATAL'S PIONEER COLLIERY ENTERPRISE—THE COMPANY'S TWO MINES—THE BY-PRODUCT PLANT AT BURNSIDE.

Capital, £175,000, in 175,000 shares of £1 each; issued, £153,500; reserve, £21,500. Directors: Senator Walter Greenacre, O.B.E., J.P. (chairman), J. W. Leuchars, John Livingston, Otto Siedle, J.P. (managing director), Owen Walters, M.I.M.E. (managing director), R. L. Hitchins, R. S. W. Barnes. London Board of Directors: Edwin J. King, John Stein Morrison (chairman), Andrew Hepburn. Mine Managers: Burnside, Ben Sokehill; St. George's, W. T. Heslop. Secretary: R. P. Gilbert. Head office: Leuchars Buildings, 326 Smith Street, Durban. London Secretary: F. W. Wicks. London office: 317-319, Winchester House, Old Broad Street, London, E.C.

The Dundee Coal Company may be rightly regarded as the premier colliery concern of Natal operations, having been commenced so long ago as 1889. The company has had an uninterrupted career of prosperity, and the output for the past few years of both mines are as follow:—1914, 379,351 tons; 1915, 320,817 tons; 1916, 412,510 tons; 1017, 369,912 tons; 1918, 336,537 tons; 11 months, 1919, 274,025 tons.

This company owns two collieries, the St. George's at Hatting Spruit and the Burnside Colliery at Waschbank. The former property is situated about 2½ miles from Hatting Spruit Station, and is connected therewith by a branch railway line. In 1912 the St. George's and the Dundee Company amalgamated. The Dundee is one of the oldest concerns of the Natal coalfields, and commenced paying dividends in 1892.

Dundee Coal Company: St. George's Colliery, Hatting Spruit.

The Company possesses in the Burnside and St. George's Collieries two properties yielding the very highest grade coal mined in South Africa, which claim is not by any means pretentious, but receives ample support from the yearly renewals of contracts for these two brands by a large number of steamship owners who make frequent use of Durban as a coaling port.

Further evidence of quality is to be found in the fact of the South African Government contracting yearly for large quantities of the Burnside and St. George's qualities for railway, marine, and general use at the highest price they pay for their coal requirements.

Strict attention is paid to the delivery of the Burnside and St. George's coals in the best condition, and the picking is hand done by Indians specially trained for the work, while the washing and screening plants are thoroughly efficient and modern.

Both collieries are fitted with up-to-date equipment electrically driven, generated by the Dundee Coal Company's own plant. Jeffrey electrical coal cutters and Siskol compressed air cutters are used, and the underground workings are well equipped with electric light.

ANALYSES AND REPORT.

Samples of coal submitted to Mr. W. H. Blake, F.C.S., Newcastle-on-Tyne, show the following analyses, which have recently been confirmed by sample taken of truck at Point:—

	Burnside.	St. George's.
Fixed Carbon	68· 1	68·94
Volatile Hydrocarbons	23·71	24·46
Ash	7· 3	5·76
Moisture	0·56	0·84
Sulphur	1·48	1·53
Volatile Matters...	24· 3	25· 3
Coke	75· 7	74· 7
Calorific value of the coal in degrees Cent. estimated by Berthelot's method in a Mahler bomb calorimeter and stated on the dry coal	8,083	8,179
Stated as British Thermal Units	14,549	14,722
Evaporative Power	15·05	15·23
Specific Gravity, Water at 60° F.=1.	1·316	1·312

The above coals were of similar appearance, being bright and of a fairly hard nature; they contained a very small proportion of matter other than coal.

The analyses show the coals to contain a low percentage of volatile hydrocarbons. The ash percentages are satisfactory. The sulphur is normal for steam coals. The calorific values are good. The specific gravity of the coals is high.

The coals are of a coking nature.

The coals yield excellent results when used for firing the boilers of steamships.

The Burnside Colliery is situated at Waschbank, in the richest coal-bearing area of Natal, about 218 miles from Durban, and the mineral leases and purchases acquired by the Dundee Coal Co., Ltd., comprise a total of 12,128 acres. The coal seam at present being worked is of a thickness of 4 feet 1 inch, thickening to 5 feet 7 inches, and is estimated to contain about thirteen million tons of good marketable coal, which the South African Government Railways in their trials reported as being a first class steam coal, particularly free from clinker and sulphur. The life of this property is estimated by the South African Government Mining Engineer at 116 years.

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The colliery is connected to the main line at Waschbank Station by a branch line of nearly twelve miles in length, constructed by the Dundee Coal Co., Ltd.

The Manager of the Burnside Collieries in his last annual report stated:—

BURNSIDE No. 1 MINE.

OUTPUT.—The total quantity of coal sold from this shaft for the period under review is 136,854 tons (2,240 lbs.) as against 150,896 tons for the previous year.

STANDAGE.—The mine lost 627 hours' work, 577 of which were due to short supply of wagons, and 50 due to the epidemic of influenza—an equivalent of 10 weeks' work.

SURFACE PLANT AND BUILDINGS.—We have added to this by the erection of two more employees' cottages, extended our native cooking kitchen, and also a large coal storage bin has been installed adjacent to the screening plant, having a capacity of 700-800 tons.

UNDERGROUND DEVELOPMENT.—We have now some 2,000 feet of development inbye the big faults met with on the north-east and north-west of this mine, also an adit or incline shaft has been commenced from a site adjacent to the screening plant, which when completed will connect up with the present north-west main haulage road, and be the means of facilitating ventilation, outputs, and the ingress and egress of persons.

BURNSIDE No. 2 MINE.

OUTPUT.—The total quantity of coal sold from this mine for the past year was 92,293 tons (2,240 lbs.) as against 90,062 tons for the year 1917.

STANDAGE.—This mine lost 532 hours' work due to short supply of trucks, and 20 hours due to the influenza epidemic, making in all 552 hours, equivalent to 9½ weeks.

SURFACE PLANT.—During the period under review we have erected a change-house for the use of European employees.

UNDERGROUND DEVELOPMENT.—We have driven in stone across the measures, and started development in the coal on the lower horizon at the faults met with on the north-east and south-east main roads.

The combined outputs for the two mines were 229,147 tons.

NEW COKE OVENS.—We have completed and put into operation a battery of 26 ovens, and at the time of writing a small washery, for treatment of coking fines, is in course of erection.

COKE OUTPUT.—Since operations commenced in April we have made and sold 3,242 tons 13 cwt. of coke, but output was again hindered at this plant due to short supply of wagons.

A large by-product plant is being erected by the Dundee Company on their Burnside property. The site of the by-product works is on the Burnside branch railway, about three miles from Waschbank station. The Coppée Company (Great Britain), Ltd., are the contractors. On completion of the plant the Dundee Coal Company will have, in addition to 40,000 tons of first-grade coke per annum, large quantities of sulphate of ammonia, tar, benzol and other by-products for sale.

THE ST. GEORGE'S MINE.

The St. George's Colliery is situated in the centre of the Hatting Spruit Valley, about 240 miles from Durban, and has a coal-bearing area of 6,416 acres, the product of which is of the same high quality as the Burnside coal, and with similar characteristics, the two making an excellent combination for steamer use. The working shafts are 320 feet deep.

The seams worked here are, approximately, 4ft. 6in and 6ft. in thickness, and lie at a depth of about 350 feet from surface.

The underground coal-cutting appliances are Sullivan punchers.

It is noteworthy that the bin erected at this mine, which has a capacity of 600 tons, was the first storage bin erected on the Natal coalfields.

The work of taking out pillars is now proceeding in the property.

The property has always been a favourite one with natives, and operations are not impeded by a shortage of coloured labour. Truck shortage has, however, been most acutely felt recently, and the mine has lost many working days on this account.

There is a coke-making plant of 29 Beehive ovens on the property.

Mr. Heslop, the manager, in his report on the operations of this company for last year, stated:—For the year ended 31st December, 1918, the output of coal from the St. George's Mine was 107,390 tons 5 cwt., and is a decrease of 21,564 tons 15 cwt. as compared with the preceding twelve months.

The mine was idle on 35 days (including Good Friday and Christmas Day), and in addition 437 hours (or 44 working days) were lost in waiting for empties. The output in October, November and December was seriously affected by the influenza epidemic.

DUNDEE COAL COMPANY: COKE OVENS AT THE ST. GEORGE'S COLLIERY.

The bin dealt with 9,780 tons during the year. This brings the total tonnage which has passed through the bin since its erection up to 101,820 tons.

Continued high costs of mining stores, increased cost of pumping, and influenza epidemic all adversely affected the cost of mining.

Nearly all the coal has again been won by the extraction of pillars from both seams. The limited amount of pit room handicaps the mine in responding to the fluctuations of demand.

During the whole year there has been considerable trouble with mine water, owing in the first instance to increased quantity, and afterwards to its extremely acid character. The corrosive action of the acid on the pumps and pipes has entailed continual work on repairs and renewals to pumps.

PLANTS AND MACHINERY.—For the reason indicated above, the bulk of the time of the engineering staff has been taken up with pumps. In this connection our small brass foundry has proved invaluable.

As the original washer built for the purpose of dealing with dross coal for the coke ovens was only designed for serving about a dozen ovens, it was found necessary to

Telegraphic and Cable Address: "MACDUFFCO."
CODES: A.B.C. 5th, Scott's 10th, Bentley's, Western Union (five letter edition).

J. R. Macduff & Co.

COLLIERY AGENTS,

Coal Exporters and Bunker Contractors,

CAPE TOWN (South Africa).

(P.O. Box No. 1137).

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Natal Cambrian Collieries, Ltd.
The Bellevue Colliery Co., Ltd.

EXPORTERS OF

Highest Grade Natal and Transvaal Steam Coals.

BUNKER CONTRACTORS AT

Cape Town, Durban & Delagoa Bay.

BANKERS: THE NATIONAL BANK OF SOUTH AFRICA, LTD.
THE AFRICAN BANKING CORPORATION, LTD.

London Agents :—D. L. FLACK & SON, 17, St. Helen's Place, E.C.3.

CORRESPONDENCE INVITED.

increase our washing capacity. This has been done by building an auxiliary washer of more than double the capacity, which re-washes the coal to be used for coking, after it has been reduced in size by passing through the crushing rolls. This has been designed and built on the mine on the Baum principle, and is giving very satisfactory results. Cost of this was £294 12s.

Six additional mealie tanks were put up during the year.

Coke Ovens.—The output of coke for the year amounted to 5,572 short tons, being an increase of 2,267 tons as compared with the preceding year.

Eight new ovens have been built in addition to the eight under construction at the end of 1917. These complete a total of 28 Beehive ovens.

For the supply of these it was necessary to double the capacity of the dross coal bin and to extend the coke siding.

Native Labour.—Ample native labour was obtained until the influenza epidemic, when we lost heavily by deaths and desertions. As soon as the epidemic ceased in the native locations, active recruiting measures were started, and by the end of December our supply was again nearly normal.

Burnside Colliery.

The Directors of the Dundee Company, in their report for 1918, stated:—

Debentures.—During the year a further £20,000 for the purpose of redemption has been paid to the trustees for the debenture holders, and the amount they now have in hand is £80,616 6s. 6d. This amount, together with interest, will be sufficient to pay at due date the whole debenture issue of £83,075.

Plant, Machinery and Buildings. The amount spent at Burnside during the year was £9,323 16s. 1d

Coal bin	£2,302	0	2
Coke ovens	4,411	16	8
Compressor	194	13	7
Adits	1,155	8	2
Screening and washing plant ...	228	1	0
Completion of cottages 23 and 24	350	9	4

At the St. George's Mine:—

Coke ovens	£2,102	13	2
Additions to cottage	32	8	8

Output.—The output from the company's mines during 1918 shows a decrease of 33,375 tons as compared with the preceding year.

1917	369,912 tons.
1918	336,537 tons.

The sale of the whole output was effected in South Africa at satisfactory prices.

Coke.—The 54 Beehive ovens (28 St. George's, 26 Burnside) were completed during the year, from which the output was 8,288 long tons:—Burnside, 3,313 tons; St. George's, 4,975 tons—8,288 tons.

A ready market was found for all the coke made, at prices fully justifying the expenditure incurred in erecting the ovens.

After payment of debenture interest £4,984 10s., dividends (No. 35 and 36) £30,700, and providing £20,897 13s. 2d. for depreciation and £9,150 for income and excess profits taxes, a sum of £40,000 has been transferred to reserve fund, leaving £19,767 17s. 1d. to be carried forward to next account.,

As a result of the influenza epidemic, during the early part of November the mines were being worked with 915 less coloured labourers than immediately preceding the epidemic, which seriously curtailed output. The labour conditions at the collieries are not yet normal.

The disease also seriously affected the employees of the South African Railways, disorganising the working of the railway, and still further handicapping the transit of coal over a system already suffering from inability to renew or replace rolling stock worked at high pressure throughout the period of the War. Special recognition is due to the officials who so ably carried out their duties under difficult and trying circumstances.

"EVERYTHING FOR THE BUILDER."

Under Modern Construction Methods and with the Labour-Saving Building Materials we can supply, it is possible to secure greater efficiency and convenience.

With the Services we can place at your disposal, together with the Experience we can bring to bear on the question, you can have Your Office, Workshop, Factory, Compound, or Your Bungalow modernised.

You and your staff will appreciate the difference

and you will thereby secure what you are looking for—A bigger return on your Capital. In many cases the cost of Building or Reconstructing under these modern methods is less costly than the old inefficient ideas.

As Representatives in Natal we are in the position to advise upon, and give you full particulars about the products of the following :—

THE TRUSSED CONCRETE STEEL CO., LTD.,

South Kensington, London, Eng. Manufacturers of the Kahn System of Reinforcement whereby you can build a Reinforced Concrete Factory, Store, Workshop, Compound or Dwelling that is Fireproof, Vermin-proof, Rigid and Lasting. This Kahn System is being used all over England tc-day to solve the Housing Problem, in making better Bridges, Bunkers, Barracks and Daylight-Saving Factories.

Under the Supervision of our Resident Engineer, Mr. A. O. Pitt, M.C.I., we are able to give you that service which you would expect from the Company.

We invite your enquiry, without obligations.

THE BEAVER BOARD COMPANIES, Ontario, Canada.

Manufacturers of the celebrated "Beaver Board;" the compressed wood pulp in panel form that makes better Walls and Ceilings. Tell us what you have in mind to alter or construct, and we will promptly send you full details.

THE BRITISH FIBROCEMENT WORKS, Erith, Kent, England.

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LEWIS BERGER & SONS, LTD., Homerton, London, England.

Manufacturers of Paints in London since 1760. A Paint for every paintable surface, and can be had in full range. We have colour charts and full particulars to send you. Write and tell us your requirements.

From the number of other Firms that we represent we are able to complete your requirements in Building Materials. These are itemised in our monthly price list entitled "Everything for the Builder," and enable you to select the goods you require at economical prices. Send a post card for this List.

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THE NATAL NAVIGATION COLLIERIES AND ESTATE CO., LTD.

STRONG FINANCIAL POSITION.—OPENING UP NEW AREAS.—A HIGH GRADE PRODUCT.

This is one of the most prosperous of the Garden Colony's coal venture. The present rate of production, owing to restricted truck supply, is about 20,000 tons per month, and the output to date has been well over five million tons.

Directorate: Dundas Simpson (chairman), Leonard Line, J.P., Hon. A. Oliff, J.P. (alternate, J. T. Oliff), J. Benfield Morris, W. Yuill, J. Townley Williams (acting chairman and managing director). London Committee: Captain B. Hansford, C.B. (chairman), E. C. Owen and A. Scott. Head Office: 28, Natal Bank Chambers, Durban. Secretary: J. T. Jones, P.O. Box 993, Durban. Johannesburg Office: 85, Cullinan Building (H. Hargreaves). London Office: 8, St. Helen's Place, E.C. London Secretary: A. Hamilton. Mine: Hatting Spruit, Natal. Mine Manager, Robert Campbell. Agents: London, Mitchell Cotts & Co.; Durban, W. Cotts & Co.; Capetown, Mitchell Cotts & Co.; Port Elizabeth, Mitchell Cotts & Co.; East London, Mitchell Cotts & Co. Bankers: London, African Banking Corporation, Limited; Durban and Hatting Spruit, National Bank of South Africa, Limited.

Natal Navigation Colliery, No. 2 Pit.

The Natal Navigation Colliery is situated in the heart of the best coal-bearing district in South Africa, 5 miles from the Durban-Johannesburg main line, with which it is connected by the Company's private siding at a point about 240 miles inland, the extent of the properties owned or leased by the company being about 13,400acres.

The colliery is equipped with most modern machinery and plant.; compressed-air coal-cutting machines are largely employed to win the coal, mechanical haulage is installed throughout the underground workings, and on the surface the coal is prepared for market by an up-to-date system of picking belts and washing plants, the efficiency of the latter being ensured at all times by means of artificial reservoirs having a capacity of many million gallons.

The shafts, surface works and dwellings are lighted by electricity generated by the company's own plant, and the pumps are electrically driven.

Some years ago the company erected the first coke making plant in Natal, and have since added to the number of ovens.

Analyses of Natal Navigation Coal.

The results obtained from Natal Navigation coal in daily use during the past twenty years fully confirm the following analyses:—

(1) By Mr. Edward Riley, F.I.C., F.C.S., London:—

	Dried at 212° F.
Carbon	81.378
Hydrogen	5.447
Nitrogen	1.977
Oxygen	2.823
Sulphur	1.065
Ash	7.310
	100.000
Volatile matter	21.22
Coke	78.78
Total	100.00
Moisture as received	.92
Evaporative power, as determined by Thompson's calorimeter	14.54

(1 lb. of this coal will evaporate 14.54 lbs. of water from 212° F.)

This is an excellent coal for steam-raising purposes; the coke is hard and coherent, and being free from pyrites, gives a loose greyish white ash with no tendency to clinker.

(Signed) Edwd. Riley, F.I.C., F.C.S.

(2) By Mr. S. B. Bilbrough, B.A., Johannesburg:—

The sample of coal submitted for heating value, marked "Natal Navigation Coal, Hatting Spruit," gives the following result as determined by the Mahler Bomb calorimeter:—

Lbs. of water evaporated, as from and at 212° Fah.	15.15
Or expressed in calories ..	8130

From the small amount of residue left after combustion, the coal apparently contains little ash. So far, this is the highest heating value for a South African coal that I have come across, and is equal to "good Welsh coal."

(Signed) S. B. Bilbrough, B.A.

After thoroughly testing the suitability of various Natal coals for marine purposes, the captain of H.M.S. Pearl reported to the Admiral on the Cape Station that Natal Navigation compared very favourably with Welsh for ordinary cruising speed at one-fifth the N.D. horse-power.

As a further proof of the high esteem in which Natal Navigation coal is held by the South African Railways, the following telegram, which was sent during the Duke of Connaught's last visit to South Africa, may be quoted

NOW IS YOUR OPPORTUNITY

TO ACQUIRE A

FIRST CLASS COAL PROPERTY

GENERAL SMUTS (Prime Minister) writes :—

> "South Africa's Coal resources are unrivalled . . . . . . and should become the basis of a great . . . export trade and world-wide commerce."
>
> (*Vide* "*S.A. Mining and Engineering Journal,*" *15th November*, 1919.)

SIR WM. HOY (General Manager of Railways) writes :—

> " . . . the coal industry of this country is, I feel, not fully appreciated. There is a big future before South Africa in the Coal Trade."
>
> (*Vide* "*S.A. Mining and Engineering Journal,*" *15th November*, 1919.)

We have For Sale a

FIRST CLASS COAL PROPERTY

IN NORTHERN NATAL

(The Best Steam Coal in South Africa comes from this district).

Thick Seams. Large Area. Close to Railway.

For full particulars write—

A. COLEMAN, P.O. Box 2297, Cape Town

> "From Divisional Superintendent, South African Railways, Durban, to Manager, Natal Navigation Collieries."

> "To prevent possibility of hitch to Royal train, and to maintain scheduled running time, send truck of your standard coal, labelled 'For Royal train purposes,' to Estcourt and Charlestown."

The three shafts on the old section of the mine are known as Nos. 1, 2 and 3 respectively.

Coal is encountered in Nos. 1 and 2 shafts at 220 feet, where at present one seam only of about 5ft. 10½in. in width is being worked. In the No. 3 shaft section the coal is struck at 80 feet. The top seam of about 3 feet 9 inches is worked where practicable.

In the new area situated to the east of the old workings one incline shaft, No. 4, was started last February, and another pit, to be known as No. 5, will be commenced about April next. In the No. 4 shaft section coal is encountered at 144 feet, where there is a top seam of 3ft. 9in., and a bottom seam 5ft. 8in. thick. In the No. 5 shaft area the coal is struck at a depth of 163 feet and the width of seam is 7ft. 6in.

It is expected that the winning of development coal from the new areas will commence in March of next year.

In addition to this new eastern section, the Natal Navigation Co. has a large shareholding in the Northern Natal Navigation Collieries, an extensive area of proved ground is situated between the S.A. Colliery and the Burnside Mine. The coal in this area is of excellent quality, and the average calorific value over the whole property is about 14.2.

The mine is not wholly free of gas, but the old portion has been exempted from the use of safety lamps, although lamps are still employed in the No. 3 area.

The coal-cutters at work in this mine consist of one Sullivan Ironclad, 16 Jeffreys and 26 Siskols.

corresponding amount as at June 30th, 1918, £10,096 9s. 8d., decrease 1919 on 1918, £1,354 18s. 2d.

It has not been necessary during the year to spend heavily on capital account. The cash liabilities and cash assets as at June 30th, 1919, were as follows:—Liabilities, dividend No. 33 (unpaid 30/6/19), £20,950; dividends unclaimed, £1,110 9s. 2d.; wages, white employees, £1,909 4s. 9d.; native and Indian wages, £2,401 12s. 3d; sundry creditors (large portion since paid), £53,859 17s. 6d.; overdraft National Bank of S.A., Ltd. Total, £102,847 18s. 11d Assets: Cash, including deposits (as per balance sheet), £155,102 0s. 0d.; drafts in transit, £61,402 16s. 11d.; coal and coke in transit and on hand, £8,473 19s. 0d.; sundry debtors (most since paid), £26,515 5s. 9d.; stores, £18,654 15s. 5d.; investments (at cost), £110,165 5s. Total, £380,314 2s. 1d., leaving a balance of cash assets and investments over liabilities of £277,466 2s. 2d. Total output (tons of £2,240 lbs.), 248,501 tons.

There is an increase in the surplus of cash assets over cash liabilities of £51,623 7s. 11d., over the surplus of last year.

Depreciation: The company has again written off largely for depreciation, the amount being £18,734 13s. 8d., as compared with £22,840 1s. 6d. last year. This brings the total written off for depreciation for the past twelve years to £176,848 19s. 8d.

Cash: It will be noticed that the cash position continues to be satisfactory, the total cash in hand, on fixed deposit, and on loan, apart from the more permanent investments in War loans and new properties being £155,102. The amount invested in War stocks has not been increased during the financial year, the increase under the head of investments being entirely due to further subscriptions for the working capital of the Northern Natal Navigation Collieries, Limited.

NORTHERN NATAL NAVIGATION COLLIERIES, LTD.—During the year ended June 30, 1919, the Navigation Collieries received a dividend on its investment in this company of 7½ per cent. The new company, like the present company, has received only a partial truck supply, and the results, though profitable, were not as good as they would have been with the fuller truck supply required for the company's business. The policy of the company in acquiring and gradually opening up new properties is to provide for the continuation of the company as the older areas are worked out. The company has been producing coal since 1898. It has two areas already proved to contain first class coal for future development and equipment, one at Makateeskop, near Paulpietersburg, and another north-east of Glencoe Junction.

NATAL NAVIGATION MAIN WORKINGS.

There are now 30 coke ovens on the mine, of which 16 are at present in use.

The directors in their report and audited balance sheet, expenditure and revenue account, and profit and loss account for the year ended June 30th, 1919, showed that the nominal capital stands at £425,000, of which £419,000 is issued, leaving £6,000 in reserve.

The extent of the property is as follows:—Freehold, 791 acres; Government leases, 1,008 acres; mineral rights, 158 acres; private leases, 11,454 acres—total, 13,411 acres.

Capital Expenditure: The items of capital expenditure brought to debit during the year were: 1919, £8,741 11s. 6d

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THE GOULDS MANUFACTURING CO. Pumps and Irrigation Material of all descriptions.
THE NATIONAL METER COMPANY. Empire Water Meters.
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CHICAGO TELEPHONE SUPPLY CO. Magneto Telephone Apparatus.
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AFRICAN IRON & STEEL PRODUCTS, Ltd.
MANUFACTURERS OF THE
Famous "Sheeley" Tube Mill Liners.

Castings in Soft and Hard Iron and Semi-Steel.

P.O. Box 1934. 'Phone 422 Central.

THE NORTHERN NATAL NAVIGATION COLLIERIES, LIMITED.

AN OFFSHOOT OF NATAL NAVIGATION.—A YOUNG COMPANY WITH BIG PROSPECTS.

This company was formed by the Natal Navigation Collieries and Estate Co., Ltd. The mine is situated on Dumbe Mountain (near the township of Paulpietersburg). 328 miles from Durban.

Directorate: J. Townley Williams (Chairman), L. Line, J.P., Hon. Albert Oliff, J.P., (alternate, J. T. Oliff), J. Benfield Morris, Richard Sneddon, Dundas Simpson.

Head Office: 28 Natal Bank Chambers, Durban.

Secretary, J. T. Jones.

Mine Manager, R. Sneddon.

Agents in London, Capetown, Port Elizabeth and East London, Messrs. Mitchell Cotts & Co.

Bankers, at Durban and Paulpietersburg, National Bank of S.A., Ltd.

The property is situated alonside the railway line from Vryheid to the Transvaal, the entrance to the adit being a little over a mile in a straight line to the railway exchange sidings, and the perpendicular height of the seam above the railway is over 600 feet.

Development started in 1917, and coal began to be despatched in February, 1918. The total despatched to the end of October, 1919, was 161,308 tons.

As in the case of other Natal collieries, the sales have been restricted by the shortage of railway rolling stock.

Northern Natal. A View of a Seam

There are four seams, No. 1 or top seam being over 6 feet thick, but of poor quality; No. 2 is about 3 feet 9 inches in thickness of clean coal of first class quality (no bands). No. 3 seam averages about 6 feet 3 inches in thickness, and is practically clean throughout and of first class quality, whilst the fourth seam is about 3 feet thick. The latter produces excellent coke, and is rich for by products recovery.

C. F. WIENAND

South African Agent for:

JNO. HY. ANDREW & Co. Ltd., SHEFFIELD.

"TOLEDO" Drill Steels,
" Mild Spring and Tool Steels,
" Tube Mill Bevelled Bars,
" Hammers and Picks.
" Shovels.
"TOREADOR" High Speed Tool Steel.
" High Speed Twist Drills.

BARWELL'S, LTD., BIRMINGHAM.

High-Class Bolts, Nuts, Rivets, Washers, Etc.

FREDK W. SCOTT, REDDISH, ENGLAND.

Steel Wire Ropes.

MINE LUBRICANTS, LTD., MANCHESTER.

Rope and Grease Dressings.
"Forum" White Bronze.
Cotton Waste.

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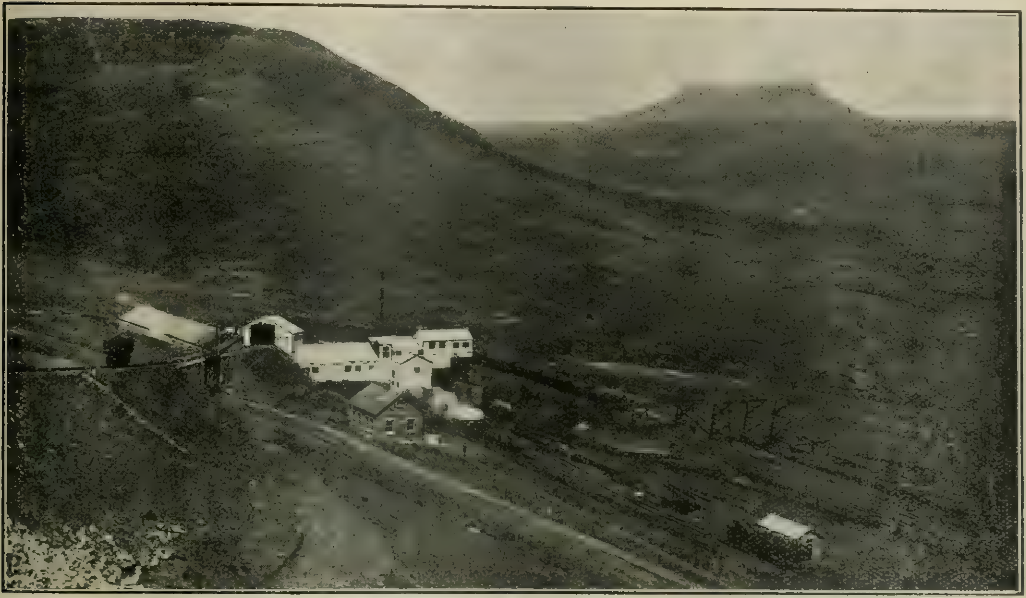
P.O. Box 1352, Johannesburg.

STORES:
Van Beek Street,
Doornfontein.
Telephones: Nos. 3 and 18 Central.

Mining is at present mainly done on the No. 3 seam. The No. 2 seam will be worked when machinery suitable for economical working is provided. The equipment is up to date, including picking belts, monitor track to bring down the coal on the steeper part of the incline haulage road, and the plant generally will be equal to handling 1,200 tons and over a day. Coal cutting will be done by two Arcwall (Jeffrey) coal cutters, to be operated electrically.



North Natal Navigation Collieries.—(With Makatees Kop Mountain in the distance.)

The property is one that has afforded an excellent opportunity of bringing into play latest efficiency methods, and of this full advantage has been taken. Working costs will, therefore, get the advantage and the necessity for dependence upon coloured labour will be reduced to a minimum.

The water supply is ample, being run to the works by gravitation. The whole of the coal is brought from the mine by adits, and there will probably be no trouble from gas (none has so far been met with), and owing to the excellent roof very little timber is required to protect the workings.

Analysis of coal made by the Borough Analyst of Durban is as follows:—

Moisture, 1.8 per cent.; volatile matter, 26.8 per cent.; fixed carbon, 64.0 per cent.; ash, 7.4 per cent.—Total, 100 per cent. Total sulphur, 1 per cent.; nitrogen, 1.82 per cent.; evaporative power (Mahler Bomb converted into steam per lb. of coal), 14.04 per cent. Other analyses have given an evaporative efficiency of as high as 14.4 per cent.

According to the report for the year ended June 30th, 1919, the financial position is exceptionally strong for a young company. Capital, £144,700, of which £124,700 shares are issued. The first dividend of 7½ per cent. was declared in respect of the year ended June 30th, 1919, and the balance sheet shows a balance of cash assets over cash liabilities at that date of £10,972 18s. 3d. The profit for the year was £40,648 0s. 9d., which with £13,010 11s. 4d., brought forward from the previous period, gave a total of £53,658 12s. 1d., for appropriation. This was disposed of as follows:—

Dividend No. 1	£9,352	10	0
Income Tax, 1918	367	3	0
Depreciation, development and preliminary expenditure accounts	7,177	15	8
Carried forward to next financial period	36,461	3	5

The company, however, have a liability which is not yet specified, to the Union Government, for taxation for the last financial year.

The cash in hand at the end of the financial year was £15,190 11s. 5d., of which £15,000 was on fixed deposit

The company holds two mineral leases, viz. (1) over Dumbe Mountain for a maximum period of 21 years from 1919, over 420 acres, all proved to be coal-bearing. (2) Lease over farms Makatees Kop and Paapkuil Vlei, containing an estimated coal bearing area of about 100 acres on the farm Makatees Kop. The latter will be worked at a later date as a separate colliery. Results of Government tests of this coal have proved it to be equal to the best. There are four seams as on Dumbe Mountain, but the marketable coal content per acre is estimated to be slightly greater.

J. MAC G. LOVE & CO., LTD.,

Mining Material Merchants,

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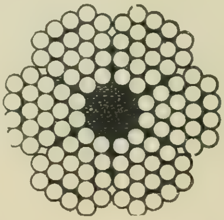
MANUFACTURERS OF EVERY CLASS OF

STEEL WIRE ROPES FOR MINES, COLLIERIES, etc., FOR WINDING, HAULING AND CRANES.

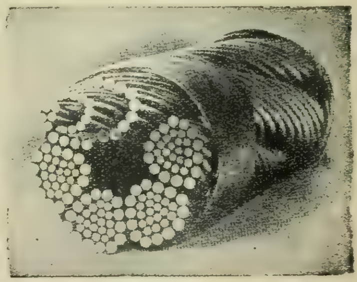
ESTABLISHED 1789.

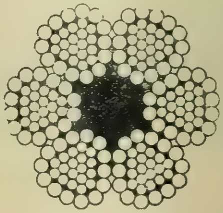
Makers of the Reliable “ROBIN HOOD” and “ROB ROY” Brands of Manilla Rope and Binder Twine. Patentees of Improved Construction FLATTENED STRAND STEEL WIRE ROPES, made entirely of round wires.

THE “ROBIN HOOD” PATENT ROPE.



6 Strands x 18 Wires, i.e., 12 Wires over 6 Wires built in triangle form.





6 Strands x 32 Wires, i.e., 14 Wires over 12 Wires over 6 Wires built in triangle form.

ADVANTAGES OF FLATTENED STRAND ROPES ARE :

1.—A flat and comparatively smooth surface, which tends to easy running over pulleys, thereby reducing friction and, consequently, wear and tear, not only on the pulleys but on the rope itself.

2.—Greatly increased wearing surface as compared with ordinary Circular Strand Ropes, the contact being evenly distributed over several wires; this only takes effect in ordinary ropes after friction has levelled the strands by wearing the outermost wire or wires to the circumference of its fellows.

3.—Flattened Strand Ropes retain a greater degree of strength, owing to the loss from wear being more gradual and extended. And **additional advantages** in our Patent Ropes are obtained on account of round wires only being used. The solid piece of triangle steel ▼ in the ordinary make of Flattened Strand Rope is displaced by a strand, built of six round wires of triangular form; we therefore obtain—

4.—Greater percentage of **effective** strength as compared with the Solid Centre Rope.

5.—More congenial conditions for the surrounding wires.

DIAMOND RUBBER COMPANY (Akron, Ohio, U.S.A.)

“Diamond” D Rubber Conveyor Belt, in use on nearly every Gold and Diamond Mine in South Africa.

Rock Drill Hose, Diamond Sheeting, and Mechanical Rubber Goods of every description. “Defiance” Driving Belting.

SHULTZ BELTING CO., Missouri, U.S.A. “Niagara” Waterproof Leather Belt. “Sable” Brand Leather Belting. “Aqua” Waterproof, Steamproof and Acidproof Leather Belt. Waterproof and Plain Cement.

THE VRYHEID (Natal) RAILWAY COAL AND IRON COMPANY.

THE PIONEER OF THE VRYHEID COAL FIELDS.

The principal coal mine in the Hlobane group of hills is the Vryheid Railway Coal and Iron Company. Its composite name indicates its projected composite development. The company was floated in 1908, and a necessary part of its mineral activities was a railway. The coal beds at Hlobane could not be developed without a railway, and the contract to construct a railway granted by the Natal Government was one of the assets acquired by the company. The railway was built and forms the first of the private railways, of which the Enyati line, dealt with elsewhere, is the second section. It is nearly 18 miles in length, and starts from Vryheid, which is on the Government railway, and ends at Hlobane Colliery. The company has the right to extend this line to Parys, which is 20 miles further.

Assets and Capital.

The company controls the coal mining and other rights on the farm Hlobane, 7,927 acres, Cliffdale, 2,280 acres, and Rietvlei, 4,700 acres. It was registered in 1908, and its secretary, Mr. G. E. Sandy, has offices at Equity Chambers, High Street, Doncaster, England. According to the formal particulars published, the company has a nominal capital of £500,000 in ordinary £1 shares. Of these 367,406 shares are issued, and there is in addition £100,000 in debentures held as a first mortgage at 6 per cent. interest. These debentures are redeemable on certain dates, subject to a bonus payment.

According to the balance sheet for the year ending 31st January, 1919, the railway and mining properties, plus leases, trading rights and options, are valued at £511,038, stocks of coal, etc., stand at £14,158, and cash at £14,737. A profit of £13,824 was made after meeting all charges, including £6,000 for interest on the debentures. The extent of the mining operations of the company is shown by the figures of the coal output for the last six years. These are:

	Tons.
1913-14	237,773
1914-15	261,697
1915-16	312,098
1916-17	421,167
1917-18	400,782
1918-19	330,636

Mine Development.

The total quantity of coal sold since the mine began production in 1909 is 2,604,930 tons. To meet the requirements of its customers the mine is developed on the big side. There are two seams of coal known as the Alfred and the Gus seams. These are persistent over this district, and run from 5 to 7 feet in thickness. There is a third seam, which is not being worked at present, though it is developed to a considerable extent, and is ready to produce coal as soon as railway and market conditions call for an increased output. The mine plans show that the mine is developed far ahead of requirements, as will be gathered from the figures of the footage driven during the year ended January, 1919. The main drives were extended 3,489 feet, and the side and cross connections were driven 92,198 feet. These figures apply only to the two seams under exploitation. The coal is worked by adits driven into the mountain side, and the conditions as to levels, size of seams, hanging and foot walls are extraordinarily good, as they are in most mines in this Vryheid district.

The Hlobane Colliery.

The Leading Mine.

Having been in operation on good seams of coal for a considerable period, the colliery has pushed itself into the front rank of the Natal coal mines, and is the largest producer in Natal. It is 310 miles by rail from Durban. The staff consists of about 60 whites and 1,500 natives, and the equipment is on a corresponding scale. Attention has been paid to the proper housing of the employees, and full provision made for their comfort and health.

Handling large quantities of coal, the mine is supplied with powerful air compressors, and washing and sorting appliances, which are situated immediately at the mouth of the adits and above the railway line. The handling of the coal is thus reduced to a minimum, but the coal being like most Vryheid coals, rather friable, loses a considerable percentage of "smalls." These are dumped on the south side of the railway. Fortunately the percentage of sulphur is small, and this great dump is not burning as the dumps of most coal mines are. The consequence is that this rejected coal is an asset. It is of a high average calorific value, and can be used later for coke making and briquettes. All the Hlobane seams are coking coals, and this circumstance adds considerably to their value.

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COAL AND COKE IN THE VRYHEID DISTRICT.

A coal mine which has been pushed rapidly ahead as a typical Vryheid district mine is the Tendega Collieries. It is the property of a private company and the usual details as to capital, etc., are not for publication. A good deal of money has been spent, however, on the venture, and the result is seen in a well-equipped mine with substantial buildings of every needed type and a powerful coal treatment plant. The whole venture is in the strong and capable hands of Mr. David Harris, who gained his coal mining experience in Wales and is well-known in the Vryheid district as a capable and enterprising manager.

This quality of initiative so necessary in a new field is evidenced by Mr. Harris's early advocacy of the electrical coal cutter in Natal coal mines, at least in mines where there is no special danger from firedamp. In the hands of ordinary natives some risk would be run by the use of electricity in the mines, but Mr. Harris has got over any possible danger from inexperienced native workers by employing white men, whose assistants are Indians. The latter are much in evidence in the Tendega mine, for it appears that while they are not more expensive than natives they are more intelligent and reliable. Only in their food is there any marked difference compared with natives, for oil and legumes such as split peas are necessary in the Indian compound.

It will help our readers to understand the quality of the equipment already erected or in process of erection in these Vryheid mines if we enumerate in some detail the various departments and their special equipments on the Tendega mine.

THE POSITION OF THE PROPERTY.

The railway line from Vryheid to Paulpietersburg passes through the property, and the junction of the mine branch line with the main line is at Zuinguin Station, where extensive sidings have been laid down to handle the output of the mine. This station is distant about 18 miles from Vryheid and 311 miles from Durban. The total length of the branch line serving the mine is 1,200 yards, exclusive of the screen sidings, which are fairly extensive and laid with 60 lb. rails.

The Tendega Company owns the farm Weltevreden No. 300, district Vryheid, on which the Tendega Colliery is situated. The farm, which is about 3,500 acres in extent, embraces the northern spur of the picturesque Zuinguin Mountain about 5,000 feet above sea level. The seams of coal outcrop in the mountain about 600 feet above the railway and works levels.

A MOUNTAIN TRAMWAY.

The coal seams being situated high up in a steep mountain a difficulty presented itself in the matter of the conveyance of the coal from such a height on the mountain to rail level, and it was decided to adopt the self-acting gravity principle. This is being satisfactorily worked through the agency of a large pair of heavy drums placed at the end of the banking platform.

The first developments were carried out on the Dundas seam—where a large banking platform has been cut out of the side of the mountain for handling and marshalling the mine trams. From this platform an incline tramway has laid at an inclination of 1 in 1·02 for 850 yards until it reaches the foot of the mountain where the grade flattens to about 1 in 12, which grade extends for about 550 yards until it reaches the gantry which leads on to the heapstead or tippler platform. The incline tramway has a double track 24 inches gauge of 45 lb. rails well fastened to ordinary railway Jarrah sleepers.

The heavy track was necessary on account of the heavy grade, and the heavy loads which would run along it, and the wisdom of its adoption is already proved. The mine trams hold about 12 to 14 cwt. of coal and are all equipped with heavy drawbars and coupled together with strong couplings similar to those in use on the South Wales coal fields. The gantry leading on to the heapstead is built chiefly of colonial gum timber, forming a very substantial structure, and is 262 feet long.

THE COAL SEAMS.

There are four seams of coal on the property, viz., the top or Alfred seam, which is not being worked at present. Next below is the Gus seam, which carries a very superior quality coal. The third seam is known as the Dundas seam. The bottom seam, 3 feet thick, is a very superior coal, with very high volatile content, and it has been proved that this coal makes the best coke in South Africa. The above seams on anlysis have given the following results:—

	Gus Seam.		Dundas Seam.		Coking Seam.	
Moisture	1·3		1·5		·90	
Volatile matter	24·		22·7		26·06	
Fixed carbon	67·1		66·3		65·60	
Ash	7·6	100·0	9·5	100·0	7·44	100·00
Sulphur	0·68		0·84		·63	

At present the Dundas, Gus and coking seams are being actively developed.

THE COKING PLANT.

In view of a probable development in the demand for good coke attention has been paid to this by-product. The coking plant consists of a battery of 28 ovens of the Belgian rectangular type, with the usual sorting, crushing and washing plant, also settling tanks. Coke is turned out of the following analysis:—

Moisture	0·2%
Volatile matter	0·3%
Fixed carbon	89·2%
Ash	10·3%
Total sulphur	0·73%

THE POWER EQUIPMENT.

Power is obtained from three Babcock & Wilcox water-tube boilers for working the screens, etc., and for the large electric generating plant which supplies the electric power all over the property and into the mine. The electric generating plant has three independent sets producing direct current of 550 volts which supplies all the motors working, the shops, and other surface plant, also tse coal-cutting haulage and pumping plants in the mine. The coal-cutting plant consists of five Sullivan "ironclad" and three Jeffrey coal-cutters.

THE SCREENING EQUIPMENT.

The screening plant consists of two revolving tipplers with a pair of double jiggers, and improved plate picking belts 60 feet long and 5 feet wide, with a shale receptacle 12 inches wide along the centre. The coal after leaving the end of these belts slides on to another belt to the side of which a bagging arrangement is attached, and at the end of the bagging arrangement is attached, the belts are hinged to form raising and lowering arms for the minimum of breakage in loading the coal into trucks. The shale from the centre receptacles of the belts drops into openings at the end of the main belts on a rubbish conveyor plate belt running underneath at right angles to the main belts and which conveys the rubbish together with the waste duff coal from the small coal jigging screens—which it picks up on its way—into the hopper for receiving same

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All the screenings falling through the main jigging screens drop on to a rubber conveyor belt 76 feet long and 30 inches wide running parallel to the main belts, and which conveys the screenings into two sets of jigging screens which separates the nuts, peas and dross which afterwards drop into receiving hoppers underneath. All the framework and buildings in connection with the screening plant are of steel construction of strong and substantial design. The workshops are equipped with lathes, drilling machines and all the usual machine tools.

The water supply is obtained from a stream situated about 2,000 yards away, and from which the water is pumped into a service reservoir with a capacity of about 200,000 gallons, whence the water gravitates to all the plant and houses on the property.

Owing to the favourable climatic and water supply conditions the company has gone in for extensive tree planting—which is proving a great success.

From the above account it will be gathered that the Tendega Colliery is in a position to become a strong competitor for any development of the export trade and of iron smelting. Mr. David Harris is, as already stated, the manager. This mine is equipped to deal with an output of at least 20,000 tons per month—wkich will be produced as soon as a regular and sufficient tonnage of trucks becomes available.

The company is registered in Natal. The head office of the company is at Leuchars' Buildings, 326 Smith Street, Durban. The sole selling agents are Messrs. Mann, George and Co. (S.A.), Ltd. The South African directors are: R. H. Parry, Esq., J. H. Muir, Esq., W. B. Calder, Esq. The secretary of the company is Mr. Charles Black.

THE MAURITIUS GROUP OF MINES.

ISLAND PIONEERS IN THE VRYHEID DISTRICT.

Recently there has been a stirring amid the quiet outlying coal areas of Northern Natal. The stirring impulse came mainly from Mauritius, an island in the Indian Ocean, some 1,500 miles straight east from Beira, and not far south-east from Madagascar.

Mauritius has been a dead island for centuries—dead as a dodo. The dodo lived there two or three hundred years ago. Didus ineptus was the great bird's name, and as it could neither run nor fly the Dutch invaders soon knocked the last one on the head and the dodo went the road to extinction that the South African quagga has since travelled—more's the pity, because it belonged to the pigeon family and was bigger than a turkey.

But Mauritius if it cannot keep dodos, can grow sugar, and has profited by the War to sell sugar. While Natal sugar growers were strictly controlled the Mauritius sugar planter, like the Cape wheat grower, sold his produce to the best advantage. There was a statement in the Press not long ago that Mauritius had sold the whole of her last sugar crop for over £50 per ton. The Natal controlled price is somewhere in the twenties. Sugar is cheaper than bread in South Africa!

Mauritius and Natal.

Perhaps it was this final flow of over £50 per ton that caused the Mauritians to look outside for new fields. Mr. R. A. Rouillard, a Mauritian, who was for long an engineer on the Rand, directed the islanders' attention to the coal beds of Northern Natal. He seems to have favoured the chances of the coke-making business. Perhaps he guessed a little earlier and quicker, than the slower South Africans, for as far back as the 10th, 12th, 13th, 16th, 18th, 19th and 20th days of July, 1917, a number of Mauritians appeared personally before Mr. Pierre Christian Vallet, Notary Public of Port-Louis, Mauritius, and signed the Memorandum and Articles of Association of the "Bernica Colliery, Limited." The Mauritians seem to regard a company flotation more seriously than most other people. Each shareholder appears before the notary and is questioned and, binds himself or herself to carry out the provisions of the Articles of Association duly and faithfully. Thus the registration of the small Bernica venture occupied seven full days of the notary's time. And well paid the island notary!

In the names so published in full we can trace the names of those responsible for this sudden flow of sugar capital into Natal coal. A clan of Mayers signed, led by Mr. Stafford Edgar Mayer, "merchant, residing in the town of Curepipe." Without them the thing could not have been done, for in these pioneering movements it is personal faith and vision that count.

THE BERNICA COMPANY.

The Bernica Company, Limited, registered under Mauritian laws, has a capital of only £17,000, divided into £1,700 shares of £10 each. Twelve hundred and ninety shares were fully subscribed, and four hundred and ten shares were divided among the vendors, thus:

To David Harris, ten shares.

To Edward Headly Hutt, ten shares.

To Richard Antony Rouillard, one hundred and ninety-five shares.

To Stafford Mayer and Company, Limited, one hundred and ninety-five shares. Total, 410 shares.

The vendors took accordingly rather less than 25 per cent. of the nominal capital of the company. It is worth putting these details on record. They should be of service to those adventurers here who are accustomed to see the proportions of vendors and working capital reversed or nearly so.

The first directors of this pioneer Mauritian Company were:—

Pierre Montocchio,
Stafford Edgar Mayer,
Maxime Boullé,
George Edward Mayer,
Edgar Piat.

The firm of "Stafford Mayer and Company, Limited" was appointed agent of the Bernica Company in Mauritius "with a commission of 2½ per cent. on the sale price of all coals mined by the company and imported into Mauritius by the Company." Mr. R. A. Rouillard, of Vryheid, Natal, was appointed Managing Director, with authority under the general power of the company, to manage its business in South Africa.

The Bernica Coal Mine.

The company owns the rights of coal deposits, which are situated about seven miles north-east of the little town of Vryheid. The coal beds are in a lofty hill two or three miles from Tendega station on the Government Railway joining the Eastern Transvaal with the main Natal railway line at Glencoe. Mauritius is a semi-tropical island, and its demand for coal is very small. If industries can be started there, coke is likely to be more in demand. But the company was more immediately interested in the South African markets, and began by opening a seam of coking coal. The position of the seam necessitated the construction of self acting truck lines, the full trucks in their descent giving the necessary power These self-acting lines are popular in these hill mines, and are, of course, cheap as regards power costs, though the wear and tear is considerable owing

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to the length of the runs. At Bernica the mine being 600 feet above the coal yards, one run of tramline is 3,000 feet long with a rise of one foot in ten feet, and the other is 2,000 feet long, with a much steeper grade. Perhaps a direct drop down the mountain would save time and wear and tear, and Mr. Barclay, the manager, is in favour of an aerial gear as better suited to the conditions.

Valuable Debentures.

It can be understood that the cost of equipping the mine was in the circumstances more than the limited capital of the company could meet. Natal mines seem to run to heavy costs in mine buildings, which are usually strongly built. Whether the regulations are more strictly enforced we cannot say, but, native compounds of brick are common, contrasting sharply with the native huts that are put up on Transvaal collieries. Solid and well built buildings are also erected for the white employees. The Bernica Company was soon compelled to raise debentures, £25,000 being raised in 250 bonds of £100 each, and bearing 10 per cent. dividend. This is a heavy rate, but it seems to be the only rate that will draw the Mauritian money. In this case the dividend is also cumulative, the interest in default in one year if any, being carried forward as a liability till paid. The debentures are repayable over five years.

This loan made the available working capital nearly £38,000. The chief items against this cash are "permanent works," standing at £17,547, and machinery and stores, the latter being valued at £5,549. Then cost of property comes in.

Coke Profits.

The making of coke seems to have been the company's chief objective, and the first report shows that 5,645 tons of coke were produced from the bee-hive coke ovens. But coal was also sent away for export, the total output for the first year having exceeded 30,000 tons. These operations left a considerable gross profit, but "interest" called for £2,288, and this figure with other deductions, reduced the net profit to £1,014. The gross profit in the coking department was nearly 50 per cent. of the total receipts. This item will now, however, be subject to the general factors dealt with in the section on "coke," and must not be taken as permanent. A profit was also made on coal sold. In view, however, of the prospects for coke an additional 16 bee-hive owens are being erected, bringing the total number of ovens to 56 of six ton capacity each.

A Small Mine.

Mr. Alexander Barclay, a competent Fifeshire coal miner, is in charge. He is working the coking seam on the long wall system, as the bed of coking quality is only about 3 feet thick, and it is all wanted. There are other seams of coal but these are not being worked at present. The total width in three seams is 15 feet of workable coal, and the hill area, estimated to contain payable coal is 90 acres. This will give the company a life of about 13 years on an estimated output of 5,000 tons of standard coal a month. In this estimate the usual liberal deductions have been made for dykes, supports, etc.

The chief asset of this colliery is its seam of coking coal, and when the expenditure on equipment is complete and a washing plant put up the profits should be good. The main source of profits will be coke. It would be a mistake to sell coal of this coking quality for ordinary steaming purposes. All that seems necessary is to wash out the small percentage of pyrites present and so produce a coke free from sulphur and suitable for all classes of furnaces.

Evading a Duty.

In connection with the attitude of the Government to these new coal mines it is worth mentioning that the siding at Bernica, where the conditions are very favourable, cost no less than £3,834. The coal plant and ovens are on the railway in this case. That the siding cost nearly £1,000 is evidence of the extent of the tax paid by these private enterprises towards the general development of the country's mineral resources. One would suppose that as the greater benefits accrue to the railway, which charges nearly 19s. per ton to carry these coals to the port of Durban, something would be done to meet the companies in these heavy costs of sidings. The Bernica, like all the other mines in the country, is also losing money over the railway truck shortage.

THE ENYATI COMPANY.

The Bernica Company was soon followed by a much more ambitious venture, one which definitely associates many of the Mauritians with the fortunes of Natal. This was the flotation of the Enyati Company, which was registered under the Mauritian Company Law in January, 1918. Messrs. Rouillard and Mayer, whose names are mentioned above in connection with the Bernica floatation, were again the responsible promoters.

The nominal capital of the company was fixed at £150,000 in 15,000 shares of £10 each. Of these shares 4,000 shares were allotted as vendors' shares. Stafford Mayer and Co., Limited, received 500 shares "in consideration of the great labour and care they have incurred and taken and relating to the promotion and formation of the company"; and 3,500 shares were paid to B. A. Rouillard for the coal and other rights purchased. These rights were valuable, and the amount taken by the vendors and promoters was again very reasonable. On the farm Enyati the coal rights over 3,600 acres were acquired and over Langekrantz 3,249 acres, making nearly 7,000 acres. In addition a contract which had been entered into between Mr. Rouillard and the Union Minister of Railways, to construct a private railway, was taken over by the new company.

It may be of service to indicate the influential character of this Mauritian movement of capital into South Africa, by giving the names of the directors of the Company. They are:—

Sir Henry Leclézio,
Mr. Evenor Tostée,
Hon. Maurice Martin,
Mr. Alphonse R. Pitot,
Mr. Pierre Montocchio,
Mr. Alphonse Lagesse,
Mr. Octave Rouillard,
Mr. Ivanoff D. de Marigny,
Mr. Stafford Mayer.

These directors are not dummies. Sir Henry Leclézio took 196 shares, and members of the family subscribed for over 800 shares, making the total family subscription in cash over £10,000. The Hon M. Martin subscribed for 980 shares (of £10 each) and the other directors are also deeply interested in the venture. We can only hope that finance of this insular variety will extend to the companies floated on the main land, and that Mauritius will not adopt the directorial fantasies common in Anglo African finance.

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The Money Spent.

But mistakes were made by the new comers. They put too much cash into the surface equipment of the mine. It is situated on the slope of a considerable mountain and terracing and building on solid and substantial lines ran away with much money. The Enyati and its sister company, the Buffalo, surprise the visitor. Together they have created a small village of substantially built brick and stone cottages and offices, whose white walls and red roofs are a conspicuous landmark to all travellers from the south. But the work done for the money is very great, and the size and prospects of the property justify the solidity of the equipment.

A Pioneer Balance Sheet.

The first balance sheet drawn up at the end of the year 1918, must, however, have made the more timid of the shareholders anxious. "Mine construction and equipment" stood at £86,745; "stores" at £12,672; and there was a loss of £8,524. Apart from smaller interests the company owed the Union Railways £56,560 for railway equipment, and had spent £37,741 on the railway earthworks. Of course there was a big debit balance at the bank. The subscribed capital of £110,000 was, it was evident, quite inadequate to carry the venture to success.

A Valuable Contract.

But the financial position had strong points in it and these were utilised: no doubt it had been intended to so utilise them from the outset. The exact terms of the contract which had been entered into between the Vendor, Mr. Rouillard, and the Union Government, are not set out, but the main provisions were first that the company should build a private railway line, starting from Boomlaager on the privately owned railway of the Vryheid Railway Coal and Iron Company whose mine is at Hlobane; secondly that the Union Government would provide rails and other stock and take payment in coal. The rails so supplied were second hand, but the sleepers were good, and the result was that the company, having completed the earthworks, found itself in possession of a full-sized railway line of 3ft. 6in. gauge well and solidly built, and with its own locomotives and ballasting trucks. There are two locomotives and ten trucks. The earthworks are nearly throughout of very heavy character, for the line winds for the major part along the base and sides of a precipitous mountain. Hence there are no easy straight runs and light earthworks after the mountain is once reached: cuttings and escarpments are the rule. Work of this class would cost nine or ten thousand pounds a mile if done by the Government, consequently these 14 miles of railway are an asset which is fully worth the amounts expended upon it.

Financing a Railway

During this year, therefore, the financial position of the company has been regularised. The Mauritians were offered debentures secured by the coal mines and railway. They responded with enthusiasm, and the whole sum of £100,000 was over subscribed during the week end. The bonds were, as usual, £10 bonds, and the interest was 10 per cent. repayable over 10 years, the first instalment being due in December, 1920. Thus the cash subscribed by the sugar Dodos for this company is already £210,000.

Coal for Rails.

The money so obtained by pledging the substantial railway assets and the developing coal mines has doubtless been utilised to pay off the amount which was due to the bank at the end of last year, complete the mine equipment and further complete the railway, parts of which still require stone ballasting. It would not be used to pay the debt to the Union railway authorities, for this debt is mainly a debt to be wiped out by coal deliveries at a certain price remunerative to the company—a price, that is, that leaves the company a profit after meeting the working cost of mining and delivering the coal. At the end of 1918 the accounts showed £56,560 still due to the Union railways, but this debt is now being reduced very fast, and it is estimated that without seriously trenching on the ordinary coal sales of the company this debt will be wiped off in two and a half years. The railway will then be free from debt, and will be the full property of the company.

The Value of the Mine.

Public issues of some importance are raised by this State policy of assisting private companies to open up and secure valuable mines in the Union. We discuss these briefly in another section under "Railways." Meantime it is necessary to complete this account by indicating the value of the coal rights secured.

The Enyati Mountain is a considerable land mass, and the coal seams are found about half-way up its face. The Enyati mines have been opened up on its eastern side. The railway comes in from the north and, crossing at a neck on the north-east slope, runs west and then south along the concave lines of the mountain face. Its summit is more plateau-like than most of these Natal hills, and the coal values are correspondingly extended. It is impossible to guess how far the large acreage of the company is mineralised. All that can be said certainly is that the igneous rocks which are much in evidence at the summit and on the sides are derived from a volcanic flow or interbedded intrusions of dolerite; that is to say, the coal beds lie on a lower plane and are not destroyed as they would have been if a great core of dyke matter formed the central axis of the mountain. The drives at Enyati have already penetrated the mountin directly for a couple of thousand feet, and these drives have proved that no great intrusions exist on the eastern side of the property.

Rapid Progress.

The management, which is in the hands of Mr. Hyde-Smith, who was for a number of years the manager of the Hlobane mine, is confident that the company possesses one of the finest and largest coal-bearing areas in Natal. The tonnage is reasonably calculated in many millions, and the quality of the coal is high, so that all the coal mined is sent to the trucks, after passing over the grids, which eliminate the fine coal. For the latter there is not, at present, any sale.

Naturally a note is kept of the nitrogen values, as this company is the neighbour of the Natal Ammonium Company, which is working the nitrogen content. The figure at the Enyati mine is 1.75 nitrogen, a proportion which is high enough to justify some attempt at recovery of the nitrogen. At present, however, work is being done mainly at the mine faces, and large quantities of coal are being sent to the port for the bunker trade. The possession of its own locomotives and trucks has helped the production of the company, and the returns for this year are increasingly good. A gross profit of £7,000 is claimed for October, and this is expected to go better for November and December. Such figures will put the balance sheet into favourable shape. Considering that the mine was opened for production only 18 months ago, the position of the company gives full testimony to the activity and energy of its management. It is claimed that in a short time the Enyati mine will be able to produce 100,000 tons of coal a month. Favourable working conditions count for much in this estimate. The railway being built for the mine runs along the mountain face just below the outcrop of the coal seams. These seams give level drives, all in coal straight into the mountain, and points of attack can be opened for distances of some miles along the railway line. It is easy to see, therefore, that the provision of powerful electrical coal cutters will enable the mine to be opened up to any desired extent

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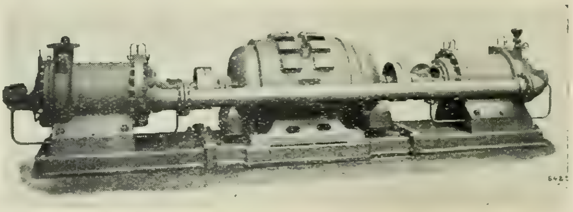

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Having been so successful in these insular incursions into the neglected waste places of the whilom "New Republic"—which was originally grabbed by the Boers, and is now annexed to Natal—the Mauritius pioneers of the Bernica Colliery placed another coal company on the Mauritian market. This was the Buffalo Colliery, Ltd. The word "Inyati" means "buffalo" in Zulu. The letter "E" occurring in the Enyati Company's name is the locative prefix of the coast Bantu languages, and Enyati suggests the "place of buffaloes."

Closely associated in the nominal field the two companies are equally closely associated in the physical; they occupy the same mountain face, and only a chattering little mountain rivulet separates the two hamlets which have sprung up so rapidly on this distant hill, in what was not long ago the manoeuvring ground of regiments of savages.

Some Mine Details.

The surface equipment of the Buffalo Company is remarkable for so young an enterprise. Workmen's cottages, compounds, hospital, hotel and of course the mine buildings needed for covering the operating machinery, are well and solidly built. Among the latter is a separate building for the switchboards of the electrical equipment which is now going up fast, immediately above the railway sidings. The mine will be further developed by the Sullivan "Ironclad" electrical coal cutters, and electricity will be used generally. Two of these coal cutters have been already delivered. There is no fire damp in the mine, as all gas has had a free outlet in the seam outcrops along the face.

The mine, like the Enyati, is built on wonderful natural lines. Big seams of coal, two in number, one 5 feet 3 inches, and the other 8 feet 9 inches in depth, lie on level beds in the hill, and the drives are like carriage-ways, straight and level and high. Mr. D. Morris is the manager. He got his experience in Wales. On the Rand he was underground manager of the Van Ryn Estates for 12 years, and the East Rand knows him equally as a coal miner. At Buffalo he has 17 whites and 500 natives under him. The mine secretary is Mr. Nicholls. The natives are mainly Zulus, and the compound rooms, with large open fireplaces, are built to fit the fancies of the Zulu braves. They appreciate even the uses of the steam box, which has been put up since typhus became rife among the coast tribes. Once a week all the blankets and clothes of the native miners pass through this steam disinfector, and the Zulu tribesmen, unlike the Argyle men, do not need scratching posts.

The Essential Things.

The property is still in the toilette stage and is getting its clothes together. It would be absurd to go into details as to its growing plant, for the machinery is still arriving on the property. But the mine, which is the essential thing, has already been developed enough to produce 10,000 or 15,000 tons of coal a month. To do this the main ways have been extended and equipped with mechanical haulage; the question of capacity is fast becoming merely one of putting in additional labour.

And the coal, like most coal in that district, is above the South African average. Its calorific value is over 13, using the local scale of figures that are really based, as explained in the interview with Mr. Harris about railways, on somewhat complicated calorimeter tests. The main thing needed in a coal used for steam raising purposes is heat, and the Natal coals will evaporate from 8 to 8.75 lbs. of water per lb. of coal, a higher value than Transvaal coals will give. It is this advantage that has sent coal consumers to the Vryheid district for coal, and enables these new companies to be sure of their market. For the amount of shale to be pitched out along the sorting belts is practically nothing—one native lad per belt suffices. The evaporative figure mentioned is for locomotives.

The tendency to break into "smalls" is dealt with in our general notes on the subject of South African coals. In this Mauritian district of Natal the tendency of the Natal coals to break into "smalls" is still prominent. It means heavy waste dumps and loss of good coal because neither the country nor the railway is equipped for the profitable use of small coal. Boilers and trucks and engines all need development and improvement.

A Chimney Stack.

By-products are a matter for the future. There is a magnificent chimney stack on the railway flat. It is built of bricks, German type self-locking bricks, that mean the strength of wire hawsers in the high slender structure. Doubtless it cost a great deal of money, which an attempt will be made some day to recover. At present the order is "sell bunker coal," and the companies are fulfilling the order with consequences that will appear in the coming balance sheets.

The Bernica Again.

This Buffalo company pays a small railway tax to the Enyati or railroad owning company for transporting its coal. The Bernica Company shareholders were the vendors. They took two Buffalo shares for each Bernica share, and as there were 17,000 Bernica shares the new company issued 3,400 shares of £10 each to the Bernica vendors. Then there were 1,000 other shares issued to other vendors, making in all 4,400 vendor shares, equal to £44,000. And the total capital is £10,000 shares; so that already Mauritian vendors are creeping up to Anglo-African standards of estimation and division of values.

Deducting 4,400 vendor shares from 10,000 shares left 5,600 for working capital. First 2,900 shares of £10 each were issued, leaving 2,700 shares. The latter have recently been issued at a premium of 50 per cent., each £10 share realising £15. The company therefore has cash reserves, but the position cannot be given in detail till the first balance sheet and profit and loss account are published. The general situation is easy. The money spent is bringing in good returns now, and the earnings are increasing monthly. All working capital, in short, has been put to remunerative use.

Broadly speaking, the Mauritius ventures, of which we have given a brief account, are in a sound way of business. Three coal mines, situated in a good coal district, have been opened up and a private railway built for their development. There has been some money wasted on over-elaborate equipment on the surface, but on the whole the money has been put into the profit winning equipment, and all three companies are earning profits, which should grow as the plant is added to and earnings increased by better handling of the coal, washing for coke, and treatment of smalls in by-product ovens. These developments will come gradually, and meanwhile the companies are earning money in supplying the existing export markets.

The Secretary, efficient and courteous, is Mr. Norman Smith, whose offices are in Vryheid.

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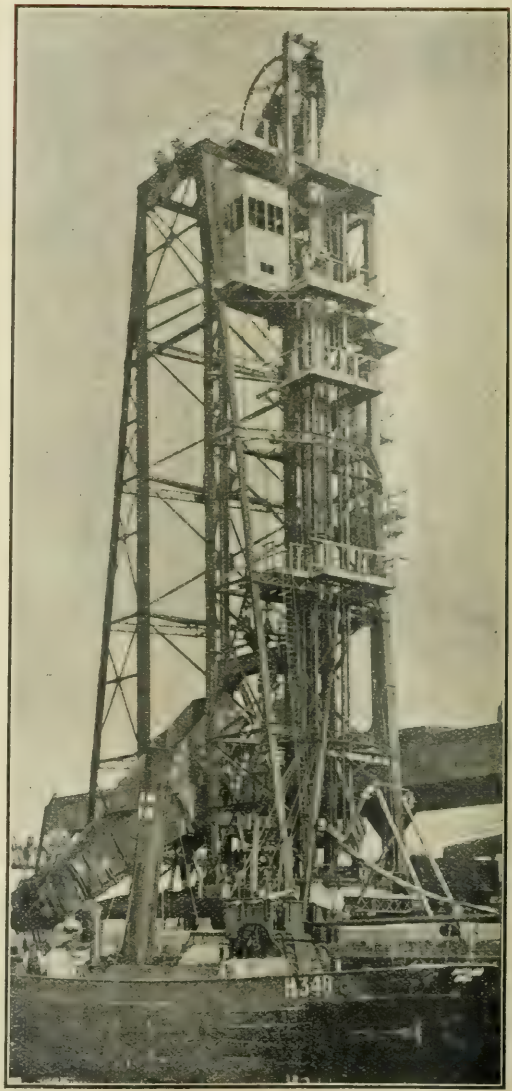

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THE TRANSVAAL'S GEOGRAPHICAL GATEWAY

UNION-MOZAMBIQUE RELATIONS.

Lourenco Marques a Great Coaling Port.

[Editor's Note.—The following articles are contributed by Portuguese writers, who set out the facts regarding Delagoa Bay's position as a port and as a neighbour of the South African Union. Our comments upon the relations of the two States appear in the general section dealing with the future prospects of South Africa's export trade.—Ed.]

View looking Eastward from the Point, Lourenco Marques. Inyack Island, the outer limit of the Bay, lies on the horizon about 20 miles out. Polana Beach, the bathing beach, is in the foreground.

In the new outlook now opening for the coal trade of South Africa, as a consequence of the events which during the past five years have so profoundly changed the face of things and are still, in their after-effects, convulsing the life of the world, Lourenco Marques is destined to play a very important role as one of the two great coaling ports of the sub-continent. Along with Durban, Delagoa Bay will participate fully in the great measure of prosperity which awaits the coal mining industry in the Union, and at a very early date, given the requisite railway facilities from the mines to the seaboard, both ports will no doubt be handling coal in quantities to be measured by millions of tons over their present traffic. For years now, while Durban has shown larger figures as regards the bunkering trade, Lourenco Marques has maintained the lead in export, a position which may reasonably be ascribed to the great and successful efforts of the Transvaal Coal Owners' Association to find markets abroad, especially on the East Coast of Africa and in India, for their products. The more efficient working and pooling arrangements among the different coal mines under the aegis of the Association have likewise on occasion given the Portuguese port a certain advantage over Durban.

In contemplating future developments of the coal trade through the two ports, particularly on the considerable scale which, it is confidently felt, is soon to be attained, one is led to believe that the interests concerned in both cases will find ample room for the exercise of all their activities, and there should thus be no repetition of those rivalries and pin-pricks which in the past have often perturbed the good harmony between the two South-east African ports. It was then a case of dividing the highly profitable import traffic for the so-called competitive area in the Transvaal, a traffic now greatly reduced and likely to be more and more replaced by production from internal sources; but in the coal trade of the future the two competitors will find themselves fully occupied in supplying both the needs of ships calling for bunkers and the requirements of what is to be a fast growing export trade. The latter, it may safely be predicted, will extend far and wide, to India, the Mediterranean ports, the West Coast of Africa and South America. Thus the ships of many nations will be diverted from the old accustomed routes to the ports of Durban and Lourenco Marques in quest of this essential industrial and domestic commodity. Each port will serve the producing area geographically assigned to it by nature, and, situated as they are at approximately the same distance from

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their chief sources of supply, there will be no question, or hardly so, of any advantage likely to give rise to jealousy. At the utmost one looks forward to a sentiment of healthy rivalry in the shape of fresh records, on one side or the other, of quick despatch to steamers, a higher yield and possibly greater economy in the handling of the coal by means of the loading apparatus at the two ports.

New Facilities for Coal Export.

The facilities now existing at Lourenco Marques will be described further on, and here it will suffice to say that they have given complete satisfaction from every point of view. It has, however, become evident that the port needs without delay a second installation in order both to provide for the expansion of the trade and as a reserve for the case of a breakdown in the existing one. The Mozambique authorities are fully alive to the urgency of the matter, and the War and war conditions unfortunately still prevailing have alone prevented the necessary steps being taken towards that end. It is part of the Mozambique Government's policy to provide these additional facilities, and, in the same way that in the past every effort was made to cater for the import trade of the Transvaal—as attested by the splendid ferro-concrete wharf and the efficient harbour equipment as regards goods-sheds, electric cranes, wharf lines, etc.—it is authoritatively declared that this Government will see to it that ample provision is made for all legitimate needs of the coal trade. It will help and foster its development in a manner that no sensible person will find cause to cavil at. The best proof that such a policy will be followed is the substantial work done hitherto, and the vast expense incurred—at the sacrifice, as is often bitterly resented, of highly valuable interests elsewhere in the Colony—in the development of the harbour at Lourenco Marques and the railway running therefrom, in both cases almost exclusively to serve the Transvaal trade.

THE MOZAMBIQUE CONVENTION.

At this point it may not be inappropriate to make some reference to the instrument which regulates the relations between Mozambique and the Union. This document is represented by the Convention of April 1, 1909, negotiated between the Portuguese Province and the Transvaal. It embodies three parts, viz.: (a) Recruiting of native labour for the mines; (b) railway intercommunication with special reference to the guarantee to the port of Lourenco Marques of a portion of the oversea import trade for the competitive area in the Transvaal, fixed at a minimum of 50 and a maximum of 55 per cent.; and (c) commercial intercourse with regard to the exchange between the territories of the contracting parties of the products of the respective soil and industries. On the establishment of Union the Convention continued in force with its provisions limited to the area originally contemplated, i.e., the Transvaal. This instrument, which was entered into for a period of 10 years with option of prorogation year by year until one year's notice of termination shall have been given by either party, replaced a temporary agreement which under the designation of *Modus Vivendi* had been in force since January 1, 1902.

Portuguese Native Labour.

From the point of view of Union interests the chief feature of the Convention, as it was the case with the *Modus Vivendi*, is, of course, the provision whereby it is permitted to the mining industries in the Transvaal to recruit native labourers in the districts of the Province of Mozambique under the direct administration of the State. This restriction meant the exclusion from recruiting activities of the territories occupied by the Mozambique and Nyassa chartered companies. The importance of this labour recruiting concession in Portuguese territory for the Transvaal mines was recently testified to by several prominent witnesses before the Low Grade Mines Commission in the statement that such labour formed the backbone of the mining industry. The remark applies with equal force to both the gold and the coal mines, the latter, especially in the Witbank area, drawing their labour from the Inhambane district, in southern Mozambique. It may also be stated that during the 17 years ended December 31, 1918, there emigrated from Mozambique for work in the Transvaal no fewer than 821,000 natives, a figure which may be increased to 900,000 if account be taken of clandestine emigrants, of whom a fair number cross the border every year.

View of the Harbour of Lourenco Marques looking South. The Town and Wharves lie on the Right

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Year.	Recruited in Mozambique.
1909	49,445
1910	68,171
1911	57,627
1912	66,551
1913	46,205
1914	42,954
1915	55,411
1916	53,474
1917	47,348
1918	44,321
Total	531,509

or a yearly average of over 53,000 workers. Only a small proportion of these natives went to occupations other than mining. The following figures show the number of Portuguese natives on the mines at the end of each year since 1909:—

Year.	At December 31.
1909	89,038
1910	97,653
1911	93,932
1912	96,919
1913	83,165
1914	75,514
1915	84,558
1916	84,692
1917	83,234
1918	81,443

A fact to be borne in mind is that the Mozambique native is not only a docile and willing worker, but puts in an extended period of service, seldom less than 18 months.

THE WAR AND THE CONVENTION.

In view of these facts Portuguese interests in the Province are apt to inveigh against a position which has not allowed the port of Lourenco Marques the share of import traffic which was to form the chief *quid pro quo*, or reciprocating advantage, to be obtained under the operation of the Convention. At the time the treaty was entered into the Portuguese port had a larger share than that conceded it in terms of that document, and between that date and September, 1912, no fewer than six alterations in the railway perferences enjoyed by the port were effected with a view to deflecting to the competing Union ports the traffic necessary to make up the share assigned to them in terms of an arrangement come to, simultaneously with the signing of the Mozambique Convention, between the Transvaal, Cape and Natal Governments. At the time the War broke out Lourenco Marques was getting approximately its due proportion of traffic, but the unchaining of the great world conflict had the effect of upsetting entirely the course of trade, and ever since Lourenco Marques has been losing heavily. The elimination of German shipping and trade and the restrictions in British and other shipping were the causes giving rise to a position which at times has presented serious difficulties from a financial point of view. The following figures show the losses sustained by Delagoa Bay over the period mentioned, on a basis of 52.5 per cent., i.e., between the minimum and maximum stipulated in the Treaty:—

YEAR	Tonnage Passing through L. Marques	Per cent. of Total Compet. Area	Loss to Lourenco Marques	
			Per cent.	Tons.
1914	179,399	48.78	3.72	13,689
1915	119,759	36.17	16.33	51,052
1916	103,363	31.19	21.31	70,536
1917	94,642	35.41	17.09	45,630
1918	56,569	27.86	24.64	50,019
1919*	48,479	31.24	21.26	32,402
Total lost tons				266,328

* January to September.

which, on a monetary basis, the Portuguese Railway Administration claims to represent a loss of fully £250,000, without account being taken of the damage involved to other interests at Lourenco Marques concerned in the handling of the transit traffic.

THE LESSENED TRAFFIC.

A very important point to consider is that Lourenco Marques is now dealing with an inward traffic for the competitive area of about 5,000 tons per month, whereas it has a capacity and has been equipped to handle something like 2,000 tons a day. The average monthly traffic for the competitive area and corresponding percentage through Lourenco Marques have been as follows since the inception of the Treaty:

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Year	Tonnage (Monthly Average).	Per cent. of Total.
1909	25,667	64.88
1910	33,949	66.06
1911	27,206	59.85
1912	22,369	55.43
1913	20,032	51.39
1914	14,950	48.78
1915	9,980	36.17
1916	8,613	31.19
1917	7,887	35.41
1918	4,714	27.86
1919*	5,386	31.24

*January to September.

THE CONVENTION THREATENED.

The position revealed by these figures is certainly very discouraging, but, fortunately, some relief has been found in an increasing and better paying coal traffic. This does not exonerate, however, in the light of Portuguese interests, the Union Government in their failure to carry out their part of the bargain. The whole question of the Treaty is due to come up for revision at an early date. In accordance with its provisions, the Convention has already been extended for one year, but it is believed that everything now points to notice to terminate being given by one side or the other, more probably the Portuguese side, on April 1st next. The relations between the two countries, connoting as they do a great intimacy of social and trade intercourse, will thus go into the melting pot. On both sides of the border there exists to-day probably a better appreciation

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of each other's obligations and interests in the important matter than at any time before, and the view may safely be taken that out of the reconstruction to be undertaken a pact will be forthcoming meeting in a fair spirit the equitable interests on both sides. The question of labour recruiting north of latitude 22 south, if brought up at all, is likely to prove a thorny point, but the main issue from the standpoint of the mining industry in the Transvaal is to ensure the continuance of the labour supply it now receives from Mozambique at the rate of over 46,000 workers a year, and which forms its mainstay. This labour is recruited south of that parallel, that is to say, in the districts of Lourenco Marques, Gaza and Inhambane, and to the continuance of such recruiting no serious objection is likely to be encountered provided, it is authoritatively stated, guarantees are given both in respect of certain advantages which it is desired to obtain and the proper and full observance of future treaty obligations. The point interests the coal mines, which in their further expansion will probably have to rely on Portuguese native labour to an even greater degree than they do to-day. In responsible quarters in Mozambique the view is taken that the Province, now that the work of internal development, chiefly in the north, is making such strides and ensures a prosperous future, is no longer dependent to anything like the former extent, for its economic existence, on either the emigration of its labour for the sake of the gold brought back by returning natives, or on the revenue from the transit trade passing through Lourenco Marques. It is, indeed, contended that all the labour which now goes out of the Province would, if properly utilised in the development of local resources, bring in far better results than those obtained from its emigration, without the very considerable drawbacks which such emigration carries with it from many points of view, health and morality among others. But those who view the matter thus are not unmindful of the all-important needs of the mining industry in the Transvaal, and are prepared to adopt a friendly and neighbourly spirit by continuing to accord it the facilities it now enjoys in the matter of labour supply. It is the sane view and will, no doubt, be found to prevail when the Convention is brought up for revision about the middle of 1920.

Railway Trucks on Wharf at Delagoa Bay.

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THE BAY OF DELAGOA.

ITS COALING EQUIPMENT.

Some Export Figures.

THE wharf at Lourenco Marques has been built in a straight line, and presents a fine appearance, being wider than any at the other South African ports. It is in ferro-concrete, over a mile long, and cost approximately £550,000 to carry out. From ten to twelve ocean-going steamers can be berthed alongside.

The wharf can be extended for many miles in the direction of Port Matolla, at the head of the Bay, with ample water depth all along. In this further extension much ground will be reclaimed, which in time will no doubt become highly valuable for industrial purposes. The existing wharf equipment comprises 18 electric cranes, one of which, with a 60-ton lifting capacity, is the most powerful in South Africa. These cranes move on rails, and we illustrate one under a testing weight.

DOCKS PROPOSED.

There is under construction a dry dock for coasters up to 1,400 tons, involving an expenditure of about £30,000. The building of a large dock has been under consideration for a long time, and it is now proposed to have a dock capable of taking ships up to 8,000 tons, the capacity to be enlarged later, if necessary, to 12,000 tons. Soundings have been taken and the ground surveyed. The work is estimated to cost £600,000, and will probably be included in the construction programme to be defrayed by the proposed loan of four millions sterling for Mozambique, now being negotiated in Europe. The deepening of the entrance channel to the harbour is another important matter engaging the attention of the local administration. The depth now obtained is between 25 and 30 feet, and it is proposed to increase this to 35 feet, so as to allow of ships trading to this part of the world entering and leaving the harbour at any state of the tide. Arrangements have been made with the great contracting firm of Sir John Jackson to send out an engineer to report on the work of dredging to be undertaken. It is estimated that the completion of the scheme will involve an outlay of about £200,000.

THE COALING HARBOUR AT DELAGOA BAY. ITS EQUIPMENT AND CAPACITY.—THE MCMYLER PLANT.

As we are dealing specially with coal our technical readers will be glad to be supplied with details of the special coaling plant in use at Lourenco Marques. Mr. Guiseppe Provay, whose portrait we give, is the capable engineer in charge of the electrical equipment both of the railway and harbours. The coaling hoist is situated at the western end of the harbour, and here there will shortly be erected the further appliances spoken of elsewhere to deal with the future expanded traffic. Steps are also being taken to provide a suitable coaling yard and the necessary shunting lines so as to put the port in a state of efficiency in catering for this trade. It is proposed by those in authority at Lourenco Marques to spare no effort in keeping the port fully abreast of the demands made by the coal traffic

THE MCMYLER TIPPER

The port has since May, 1914, been equipped with an electrically driven coal loading appliance, of the McMyler System, by which the contents of any size and capacity trucks up to 85,000lbs. of coal are dumped into shipholds at the lower end of the inclined coal pan, into which the trucks are emptied. There is a telescopic chute of square section, which, reaching down into the ship's hold, prevents a big drop of the coal, and serves as well to aid in the work of trimming, the lower part of this chute being movable in four directions.

The electric motors are continuous current for 500 volts working pressure, and of the following normal rated output:

Two 250 h.p. compound wound motors for hoisting the cradle with the truck.

One 50 h.p. series wound motor for lifting or lowering the apron of the pan.

One 75 h.p. series wound motor for operating the pan or big chute.

One 33 h.p. series wound motor for controlling the telescopic chute.

One 50 h.p. series wound motor for working the ship haulage gear.

Total, six motors of an aggregate capacity of 708 brake horse power.

The control of the two cradle-hoisting motors is automatic on the principle of "Magnetic Contractors."

Formerly all loading of cargo and bunker coal was done by hand, by baskets on the heads of natives or by means of tip-buckets of half up to two tons capacity handled by the ordinary electric wharf-cranes.

ELECTRIC POWER HOUSE.

The new plant was ordered by the Government of the Province of Mocambique on the 17th of April, 1913, and was erected and in working order by the 18th of May, 19[illegible].

The contractors were Messrs. the McMyler Interstate Company of Cleveland (Ohio), U.S.A., for the whole plant. They built the mechanical part, the electrical equipment being supplied by the Westinghouse Electric and Manufacturing Co., of Pittsburgh (Pennsylvania).

In connection with the coaling machine there is between the power station and the hoist an accumulator battery—so-called floating battery—of 265 cells, 1,332 ampere-hour capacity on the one hour rate of dischage, together with an Entz Booster set. The battery is of the well known Tudor System, and was supplied by the Hagen (Westphalia) Works of the Accumulatoren-Fabrik Aktiengesellschaft, Berlin; the Entz Booster set was built by the General Electric Company of Schenectady (N.Y.), U.S.A.; the Booster motor is of 130 h.p., 178 amperes, the generator of 980 amperes, 90 up to 150 volts, normal rated output

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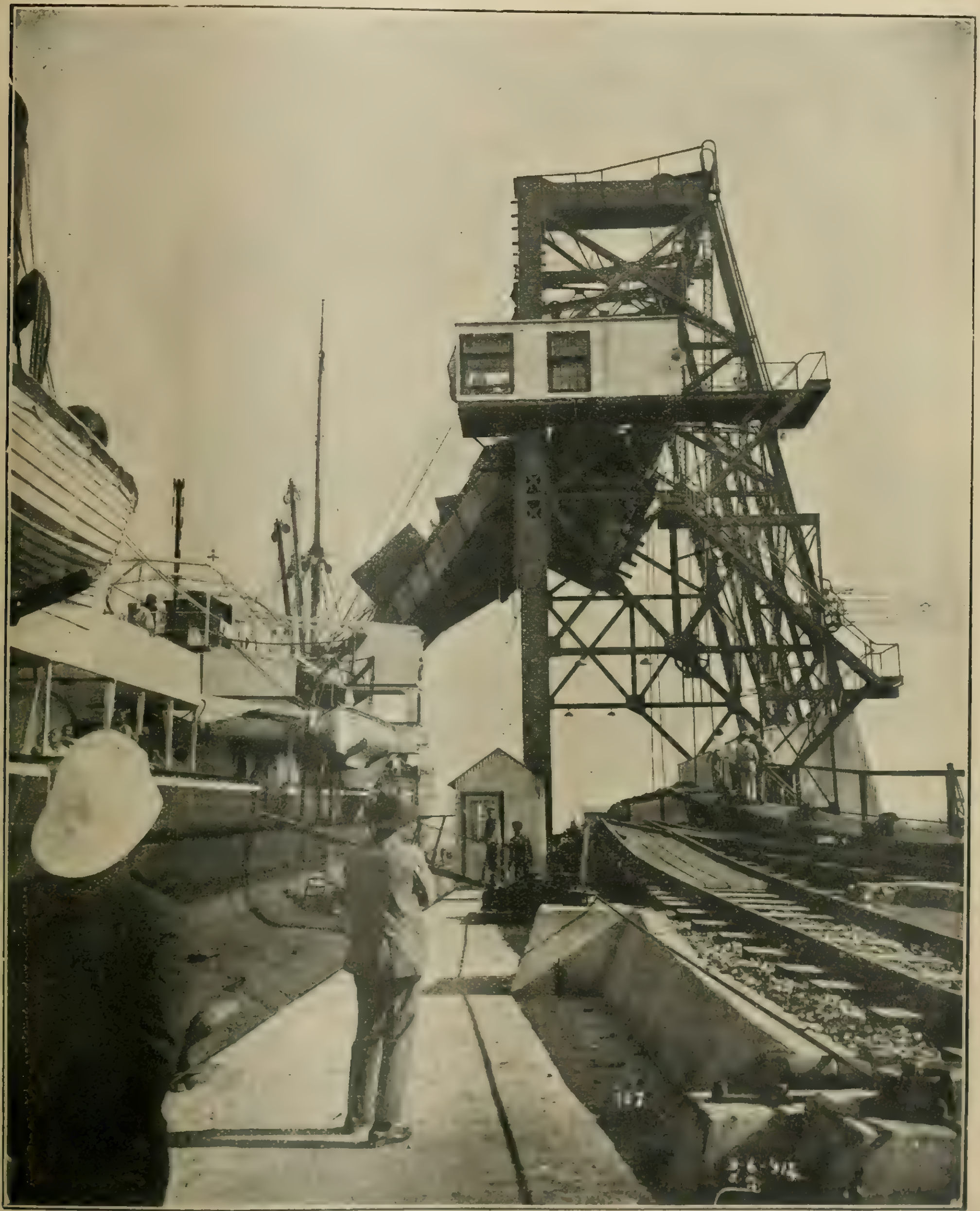

The McMyler Tipper, showing Coal Truck emptying into Shiphold.

The Cost of the Coal Equipment

The cost of the entire plant was about £30,000, including two 80-ton weigh-bridges fitted with automatic weight printing device built by the Howe Scale Co., of Rutland, Vt., U.S.A., and a ship haulage machine built by the Litchfield Machine and Foundry Company of Litchfield, Ind., U.S.A., for the purpose of moving ships, *i.e.*, changing the holds beneath the telescopic chute independently of working the ship's own winches or capstans.

About £15,000 was spent on the foundation for the plant itself, and £40,000 in building 200 metres of wharfage adjoining the appliance. Another expenditure of about £15,000 was necessary for earthworks, filling in, approaches, reclamation of the foreshore, etc., making a total expenditure of roughly £100,000.

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The specified capacity of the plant was for a minimum of 400 tons per hour; as a matter of fact this was exceeded at the first trials, and the following record of working during 1919 shows the higher capacity attained:—

Date	STEAMER	Tons of 2,000 lb. Loaded	Actual Working Hours	Tons per Hour
7/1	E.O. Saltmarsh	3,865	6.53	592
9/1	Inverness	3,960	6.46	585
13/1	Meiten Maru	3,557	6.41	530
18/1	Irismere	3,703	5.59	622
29/1	Whateley Hall	3,922	6.37	616
7/2	Claveresk	3,662	5.21	677
	Dirphys			
22/2	Lowmoor	3,650	5.30	664
1/3	Ormara	4,127	6.65	621
5/3	Karoo	3,513	5.55	588
21/3	Australbrook	3,688	6.02	611
28/3	Clan Kennedy	3,869	5.11	744
26/4	Irismere	3,796	6.03	627
27/5	Inverness	3,845	5.57	654
6/6	Pearlmoor	3,538	6.03	584
15/9	Benfield	3,522	5.27	646
30/9	Seattle	3,893	5.50	664
22/10	Gogra	4,036	5.49	696
23/10	Gogra	3,863	6.00	644
25/10	Sydic	3,695	5.39	654
31/10	Pearlmoor	3,611	5.30	656

Since 18th of May, 1914, the following tonnage of coal has been loaded by the plant, the tonnage of coal loaded by other means being also shown:—

	Tons Loaded by the McMyler Hoist	Tons Loaded by Baskets, Buckets and Electric Cranes	Total Tons
1914	188,439	372,958	561,397
1915	330,935	161,552	492,487
1916	509,897	248,122	758,019
1917	457,412	410,002	867,414
1918	502,175	260,703	762,878
1919 (6 months).	316,554	120,447	437,001

Mr. Guiseppe Provay.
Electrical Engineer, Port and Railways, Lourenço Marques.

The total export of coal from Lourenço Marques during the years named is given in the right hand column of the above figures.

Coal Bunkered.

Since 1914 figures have been available regarding coal exported as bunkers. This represents one-third of the total report, being approximately as follows for the under-noted years:—

1914	193,000
1915	138,000
1916	346,000
1917	444,000
1918	269,000
1919 (6 months)	106,000
Total	1,496,000

Steamers from all parts of the world call at Lourenço Marques for coal. It would not be of interest to give a detailed list of these ships as recorded in the harbour records, but the destination for which the ships cleared are of some importance. The list of ports includes Alexandria, Aden, Bahia Blanca, Beira, Buenos Ayres, Bombay, Batavia, the Cape Ports, Colombo, Ceylon, Diego, Saurez, Dar-es-Salaam, Dijubuti, Freemantle, Kilindini, Loanda, Lobito Bay, London, Las Palmas, Majunga, Manila, Mombassa, Montevideo, Muscat, Marseilles, Port Said, Port Louis, Port Sudan, Perim, Piraeus, Port Adelaide, Penang, Palermo, Rio de Janeiro, La Plata, Rangoon, Réunion, Singapore, Sabang, Santa Fe, South Georgia, Suez, Sierra Leone, Tandjong, Tanga, Vizagapatam, and Zanzibar.

The ships calling were chiefly British, but apart from Portuguese boats, Scandinavian and Dutch owners were chiefly represented. During the war the Japanese and other flags were well represented.

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THE DELAGOA BAY RAILWAYS, AND THE COAL TRADE.

The harbour and railways of the Delagoa Bay district are practically under one administration. The main line is some 50 or 60 miles long between the prot and the Transvaal Border.

The main line between Lourenço Marques and the Transvaal border at Ressano Garcia has in recent years been considerably improved. Its bridges have been reinforced to admit of the circulation of the heavy high-powered locomotives now being used, and shortly it will be provided with 80lb. rails throughout. Trains can now attain a speed of 60 kilometres (37.5 miles) per hour over nearly the whole route. The capacity for coal traffic, when once all projected improvements have been made, will be 8,000 tons per day. To-day it is possible to carry 5,000 tons, a limit never reached on account of the scarcity in rolling stock.

The equipment provided by the Portuguese Administration comprises:—Seven first and second-class passenger coaches, 10 native coaches, 15 tenders, 1,081 trucks, including 280 iron bogies 10 cold storage wagons, 39 locomotives, including two Mallets and five Santa Fé.

The C.F.L.M. have on order:—Five Santa Fé locomotives, three Pacific type locomotives, six first-class passenger coaches.

The locomotives on order, which have been manufactured in America, are due to arrive at Lourenço Marques at a very early date, while the passenger carriages are expected to come to hand at the beginning of the new year.

In terms of the pooling arrangement in force between the Union of South Africa and the Portuguese Administration regarding combined traffic, the Portuguese tally of rolling stock shows an excess over their quota amounting to about 300 trucks and other vehicles. The new locomotives will be of great material use in giving quicker despatch to the coal traffic over the Portuguese section of the line.

It should be noted that the distance from Johannesburg to Lourenco Marques by the existing railway is 495 miles or vrey nearly 100 miles less than the distance from Johannesburg to Durban. The present route to the Portuguese port is somewhat circuitous, and soon after the Boer war the railway from Lourenco Marques to the Rand via Swaziland was projected. This line when completed will reduce the railway distance from the Rand to Delagoa Bay to 340 miles, that is 135 miles less than the distance from Johannesburg to Durban.

The C.F.L.M. (Caminho de Ferre de Lourenco Marques) is throughout a completely equipped modern railway, the main stations at the terminals being lighted with electric light and the smaller stations with acetylene gas light. From the picture we give of the main facade of the railway station at Lourenco Marques it will be seen that the buildings do not suffer by comparison with other large city railway stations in South Africa. The tiled pavements in the foreground, which are regularly flushed, should be noted as an indication of the care taken with regard to sanitation and cleanliness which are so necessary in a sub-tropical climate.

RAILWAY STATION AT LOURENCO MARQUES—MAIN FRONT.

Colonel Sa Carneiro, the Engineer Director of the Railways, is absent at present on leave and his place is filled by A. B. de N. Oliveira Andrade.

A. B. DE N. OLIVEIRA ANDRADE.

THE OUTLOOK—NEW COAL POSSIBILITIES.

The facts and figures brought to light in the course of these articles go to show that Lourenco Marques has all the necessary conditions to become a great coaling port. It possesses a vast, land-locked, perfectly safe harbour, indeed, one of the great harbours of the world—unlimited scope for wharf expansion under conditions which permit of construction work being done far more economically than can possibly be done at any other South African port. Nature has unmistakably provided in Delagoa Bay a splendid gateway in convenient geographical propinquity to the great coal bearing areas of the Transvaal and Swaziland. The latter country, still imperfectly known regarding the extent of its mineral resources, is reported to contain valuable coal measures which the coming Swaziland Railway will soon unfold. The Province of Mozambique itself is not entirely wanting in coal resources. The theory has often been propounded that the coal measures underlying the Eastern Transvaal will be found to extend to this side of the Lebombo mountains, and at the moment some prospecting is being carried out with a view to test some portions of the Lourenço Marques district. Indications found at certain points seem to bear out that theory, but naturally the matter is still in the realm of doubt.

ZAMBESI COAL FIELD.

In the northern parts of the Province actual discoveries of coal have been made, and at the moment it is understood that British interests are taking up an important coal proposition in the Sinjal region in the district of Tete, immediately to the west of the Port Herald-Chinde railway, on the northern bank of the Zambesi river. The Beira Zambesi railway, to be built as soon as it becomes possible to obtain the necessary material, will easily serve these coal fields, and thus provide Beira with far cheaper fuel than the price at which coal can now be obtained from the Wankie collieries. The coal is said to be well up to the South African

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LOURENCO MARQUES.

standard. Indications of coal have also been found in the territories of the Nyassa Company, in the northern extreme of the province, but nothing has been done to prove their value. This goes to show, however, that the future may bring some surprises in the way of coal discoveries in this part of Africa.

General view of Wharf at Delagoa Bay showing Railway Tracks

Meanwhile we need only concern ourselves with the possible developments with regard to the existing sources of supply. The doubling, or, possibly, quadrupling of the coal export at no distant date will mean much to the progress of Lourenço Marques, and for this reason the Portuguese authorities may be relied upon to afford every facility to the expansion of this Transvaal industry through their port. Their readiness to do so is shown in the decision already come to to undertake important improvements with the view of expediting the handling of the traffic. Larger works commensurate with the probable needs of the trade will no doubt be given effect to as soon as it is shown to be warranted by development. From the very beginning the Port and Railway Administration at Lourenco Marques has given proof of commendable zeal in assisting the coal traffic. Much thought has been given to the subject by those who have been primarily concerned in the work done, including the former directors, Engineers Lisboa de Lima and Von Hafe, the present director, Colonel Sá Carneiro, and the Port Electrical Engineer, Mr. G. Provay. Such men have laboured hard and done well for the coal mining industry of the Transvaal.

The Swaziland Railway—A Vexed Question

In connection with the railway development of Eastern Transvaal a valued Portuguese correspondent, writing from Lourenco Marques, calls attention to the question of the Swaziland Railway and the delay of the Union Government to carry out the promises made. We comment on this question in the section dealing with "Railways" generally. He writes:

In thinking of a greatly enlarged coal export from the Transvaal mines, consideration must necessarily be given to the vital question of transport to the coast. The existing single track line has a limited capacity, capable of being but slightly increased by electrification, the report of the expert Mr. Merz placing such improvement at merely 5.6 per cent. over the present steam traction system. It is, therefore, out of the question to rely on this line for a greatly expanded coal traffic, and the time has thus come for the construction of the much-delayed railway section which is to link the Lourenco Marques-Swazi border line with Breyten, in the Eastern Transvaal, and so with Johannesburg. It is safe to say that no other railway project in South Africa in the last twenty years has had such a checkered career as this much debated scheme through Swaziland. Initiated by Lord Milner, then Governor of the Transvaal and High Commissioner for South Africa, whose foresight and business acumen were quick at perceiving the great importance to the Transvaal of the shortest possible connection with the cost, thus cheapening transport and enabling the country to develop on sound economic lines, the projected railway was intended to be a factor of the highest value to the country, inasmuch as its construction would be under conditions enabling the line to be worked as cheaply as any in South Africa.

Portuguese Faith.

In 1903 the Portuguese Government was induced to take up the project of building its section of the new through route, an action which was supported, it is claimed, by an unequivocal promise on the part of Lord Milner that by the time the Portuguese engineers reached the border at Umbelozi Poort they would find their British colleagues on the Swazi side ready to join up the two railways. On this assumption the Portuguese section, starting from kilo 10, on the Lourenco Marques-Komatipoort line, was begun in 1905, being first taken to Mailana and later, in 1912, to Goba, the present terminus, within a short distance of the Swazi border. This line, built at a cost of £400,000, is a fine piece of engineering, having been constructed with a view to the handling of traffic on a large scale. From Lourenco Marques to Goba the line measures 43.75 miles, and by this route the distance between the Bay and Germiston is reduced to about

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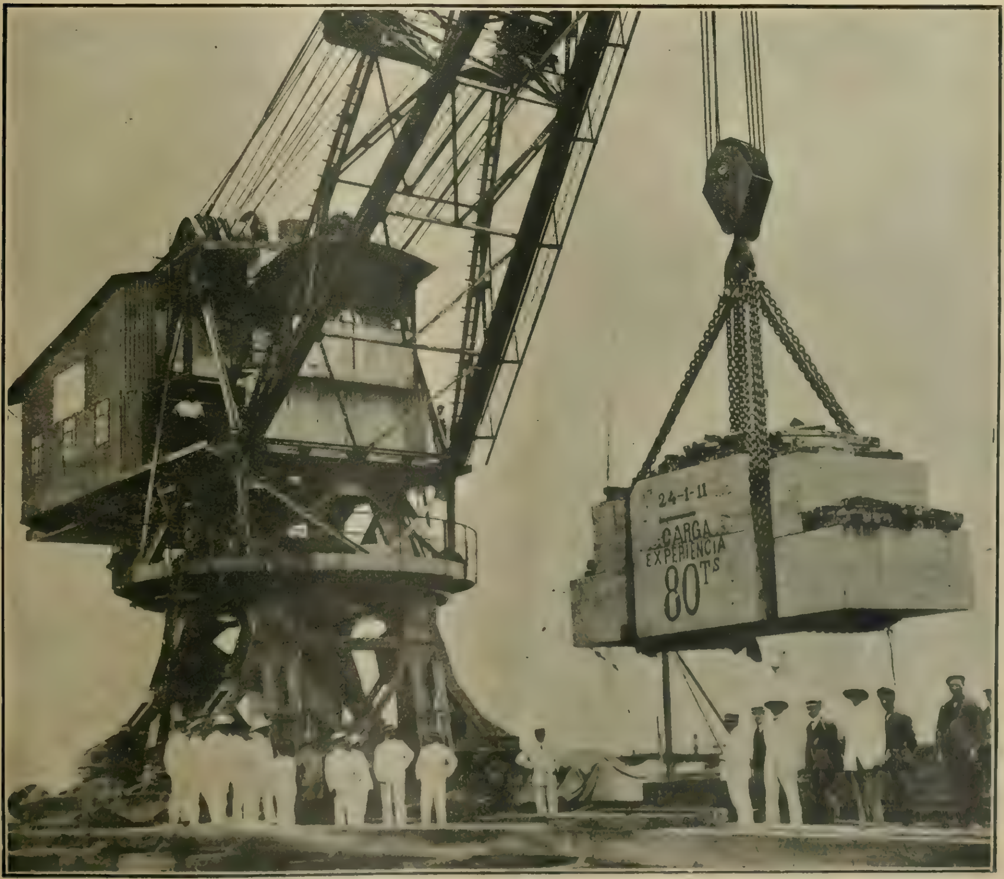
324 miles. It is interesting to record that at a conference on Western Transvaal railways held in 1904, Lord Milner said that direct traffic from Lourenco Marques to Johannesburg and beyond would before long come via Swaziland and Springs, while the late Sir Thomas Price, the General Manager of the Central South African Railways, prophesied that this achievement would be realised in 1905. The years have gone by, and one of the really vital connections on the railway system of the country remains unaccomplished.

Two Serious Charges.

Thus to Portuguese eyes there are two aspects of the relations between them and their western neighbours calling for explanation and correction. One is the manner in which the very definite undertaking regarding railway extension through Swaziland has been ignored, and the other is the failure on the part of the Union to carry out the apportioning of the oversea trade for the competitive area in terms of the existing convention. The latter question is indeed recognised as having presented peculiar difficulties under the War conditions, which have prevailed during the last five years, but as regards the former there seems to be no legitimate ground for the non-fulfilment of what was to all intents and purposes a bilateral obligation, which on the Portuguese side was carried out and on the Union side has been ignored. The position as it stands to-day is one of reproach calling aloud for rectification at the earliest possible date. Indeed, it is now said the Union Government has signified its intention of building the line from Breyten especially with a view to the development of the country to be served, and a recent published statement is to the effect that this will be one of the first schemes to be taken in hand as soon as railway construction is again possible. The opposition which certain interests in Natal raised to this line is by now worn out, and there should be no likelihood at this stage, when the work of development requires unmistakably that the cheapest and most efficient means of communication be brought into play, of a repetition of the working of those political influences to which Lord Milner's immediate successors showed themselves so susceptible. It is on record that though the line on the Portuguese side was constructed with the cognizance stey by step of those in authority in the Transvaal, still when the time came for deciding finally on the point at which the junction was to be made on the Portuguese-Swazi border difficulties were raised by the Transvaal as to the feasibility of the scheme, and the matter has been allowed to drift ever since. The recognition of the obligation, though tardy, will do much to engender a better atmosphere at Lourenco Marques, and thus conduce to the tightening of the friendly bonds so eminently to be desired between the two countries. Hung up as it now is somewhere on the veld, the Swaziland line is a dead loss, with a deficit of about £12,000 on the year's working, plus £20,000 for annual interest and redemption charges on the loan obtained for its construction.

Lourenco Marques,
December, 1919.

TESTING A CRANE



View of the Powerful Electrical Machinery in use at Delagoa Bay.

GREAT BRITAIN'S COAL EXPORT.

HOW IT IS HANDLED AT WELSH PORTS

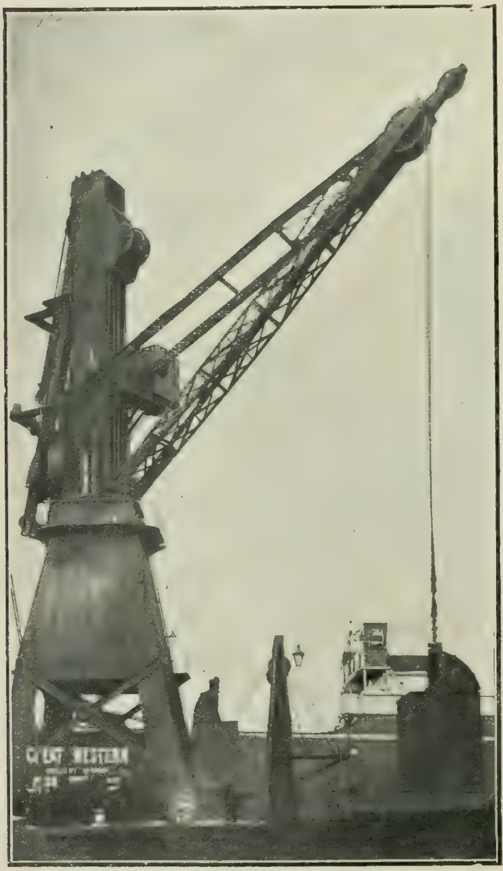


Fig. 1.—One of the many Coaling Cranes fitted with Lewis Hunter Coaling Boxes at the Cardiff Docks.

We are giving in other chapters of this special coal issue full particulars of the methods of handling coal at South Africa's two chief coal-exporting harbours, and it will be of service to readers if we put them in a position to compare these local plants with the plant in use in the great coaling ports of England, the country which has led in creating a vast coal export trade over the world. We shall also describe briefly the coaling methods at New York, which is America's great port. It may be said at once that the two harbours of Durban and Lourenco Marques do not suffer in the comparison. In this connection the figures we give below are of interest, for they prove that the equipment possessed by South African harbours are capable of handling the heaviest coal traffic, the only requisite being that the items in the present or similar plant shall be increased with the increase in the quantities of coal offering. The trend of recent developments is towards oil fuel, which is daily coming more into favour either for raising steam, or when used more directly in the internal combustion engine. Yet scientists continue to warn us that the world's supplies are limited, and that we cannot look forward with any certainty to a continuance of the copious supplies that have been available during the last few years. At all events, we can safely assume that the predominance of coal as a source of energy, will outlast our generation and probably the next.

For the facts given herein and for the illustrations we publish in this article we are indebted to Capt. Travers, the local representative of Messrs. Sir W. G. Armstrong, Whitworth & Co., the makers of the coaling plant pictured below.

Some Striking Statistics.

The immense natural resources of Great Britain are perhaps her most valuable, as well as her most indispensable, possession. In 1913, the last normal year we can refer to, the total production of the mines was in the neighbourhood of two hundred and eighty million tons. Approximately three-quarters of this met her own industrial needs, and, with the aid of her mercantile supremacy, she has for half a century been the chief supplier and distributor of coal to the less favoured parts of the world, and although a continuance of that position, after the disturbing influences of the War, may appear to be doubtful, we must remember that the class of coal known as Welsh Steam is the very best that has yet been discovered, and will remain in demand until some even more suitable fuel is found and in sufficient quantities.

The total amount of coal shipped from Great Britain, after supplying her own internal needs, was as follows:—

Year.	Tons.	Value.
1913	73,400,118	£50,727,252
1914	59,039,880	39,862,008
1915	43,534,560	36,391,690
1916	38,351,553	46,386,297
1917	34,995,787	46,547,621

An analysis of the figures for 1913 and 1914, showing the ports from which coal was shipped (over 1,000,000 tons per annum) may also be of interest:—

	1913.	1914.
Leith	1,424,920	1,335,102
Grangemouth	1,517,152	907,296
Burntisland	1,952,030	1,420,857
Swansea	4,451,597	3,621,600
Sunderland	4,027,806	3,254,583
Port Talbot	2,318,699	1,637,215
Newport	4,841,786	4,247,172
Newcastle . .	13,619,502	11,748,068
Hull	4,728,787	3,056,368
Hartlepool	1,257,934	1,186,266
Immingham	2,984,187	2,219,967
Grimsby	1,326,377	895,032
Cardiff	20,095,081	16,474,787
Blythe	4,175,827	3,452,139

The Predominance of South Wales.

A glance at the above figures indicates the predominance of the South Wales ports, headed by Cardiff, with which is included the adjoining docks of Barry, and shows a total of no less than 29,389,264 tons in 1913 and 24,343,559 tons in 1914, which is 40.2 per cent. and 41.3 per cent. respectively, of the total exported from the whole of the United Kingdom.

In 1913, the last year of normal conditions, nearly 57 million tons of coal were raised to the surface by the 670 odd collieries in South Wales, or about 20 per cent. of the total output of the United Kingdom, and of this nearly 50 per cent. was exported overseas.

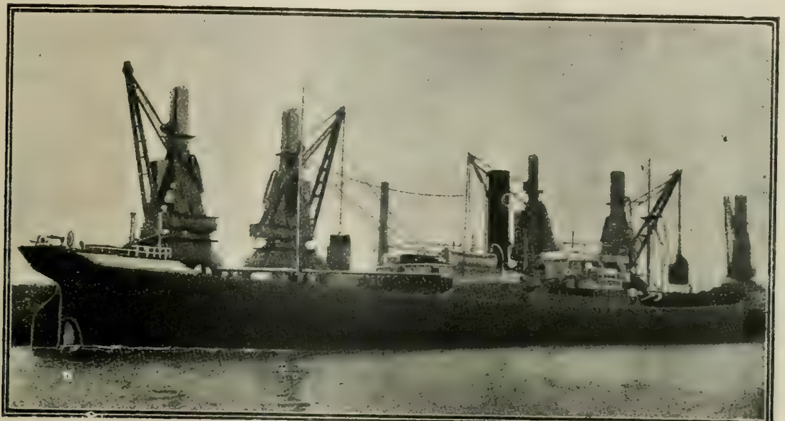


Fig. II.—Hunter Cranes Loading a Vessel.

This very valuable export trade has placed the ports of South Wales in the keenest competition with each other in the equipment of up-to-date docking facilities and the most modern shipping appliances for the rapid handling of coal, with the result that Cardiff, with her export of over 20 million tions of coal per annum, has become, in point of view of clearances, the first port of the world.

Coal Shipping Plant.

We may remark at the outset that the coaling plants at Cardiff and Barry, as well as at nearly every other port in in Great Britain, are operated by hydraulic power with a working pressure of 750 to 800 lbs. per square inch, it being found that this system gives the most reliable and efficient working, together with the minimum of upkeep and attention, under the conditions which are incidental to the handling of coal.

There are two systems of loading coal into a ship adopted at the Cardiff docks. The one is the Lewis Hunter type of coaling crane—of which there are about twenty in number—and the other by means of a truck hoist or car dumper or tipper.

Coaling Cranes.

Fig. 1 shows a modern coaling crane of the type referred to above, and has a lifting capacity of 23 tons through a range of 60 feet, and of luffing it from a maximum rake of 50 feet to a minimum of 18 feet, with a turning range of 360 degrees. There is also an auxiliary lift of 3 tons capacity working at a lifting speed of 300 feet per minute at a maximum range of 65 feet when the crane is required for handling ordinary cargoes.

The system on which the plant works is as follows: The loaded trucks, of either the bottom or end door pattern, are run on to the tipping cradle shown in the foreground of our illustration. The cradle is tipped by means of a small hydraulic ram and cylinder, when the coal passes down a shoot into the coaling boxes, which rest in a pit below the ground level of the dock. These boxes are of special design, covered by the Lewis Hunter patents, and hold from 15 to 20 tons of coal, which is the contents of one truck. The box is then lifted, swung over the hatch and lowered into the hold. A coned bottom door is fitted to the coaling box, which is operated by a small hydraulic cylinder on the crane pillar from the driver's cabin, and the coal "teemed" into the hold. By this method the minimum of breakage of the coal is attained—an item of very great importance with brittle coal which is considerably depreciated in value on a foreign market when broken up through rough handling. The cranes are of the travelling type, and can be moved along the quay side to plumb the hold.

Fig. 2 shows a vessel being coaled by four of these cranes simultaneously. As an example of the handling capacity of this plant we may mention the case of a vessel which took on board 6,715 tons of coal in the course of 11 hours, and

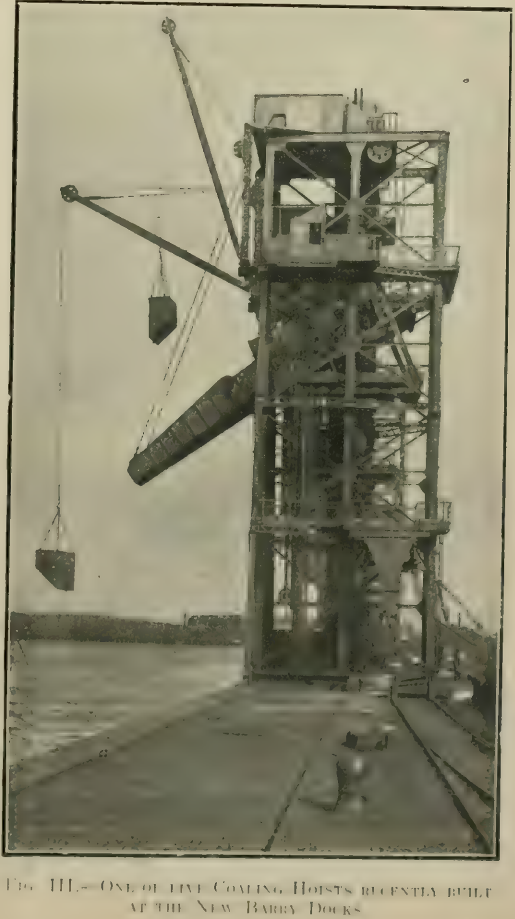


Fig. III.—One of five Coaling Hoists recently built at the New Barry Docks.

without detriment to the cargo. It is also a feature to be noted that very little trimming of the cargo is necessary with this system of coaling.

We understand that these cranes give the Cardiff Railway Company the greatest satisfaction on account of their reliability, high speed of working and small cost of maintenance.

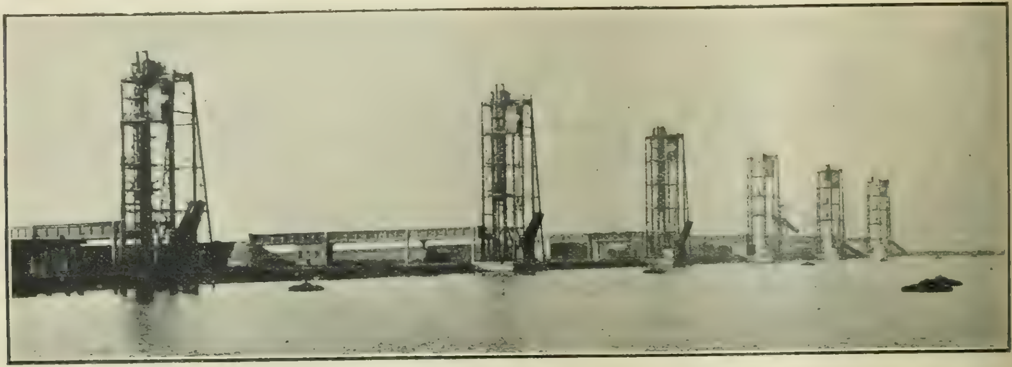


Fig. IV.—Battery of Six Coaling Hoists at the Great Central Railway, Immingham Docks.

Coal Tips or Car Dumpers.

This method of loading a ship is perhaps more widely known in South Africa and is clearly shown by the illustrations.

Fig. 3 shows one of the five modern coaling hoists (3 fixed and 2 movable) which have recently been installed at the Barry Docks. It should be mentioned that they are arranged so that at least two tips can be working into a ship at the same time. The lifting machine, for raising the wagon cradle, is double powered so that trucks of 20 or 12 ton capacity may be handled without waste of power. The hoist is designed to handle a gross load of 30 tons a a lifting speed of 180 feet per minute to a height of 60 feet above the quay level. The cradle carrying the trucks is raised by means of wire ropes which pass over a 2 to 1 multiplying gear to the main lifting machinery which is attached to the side of the hoist framing. The weight of the cradle itself is balanced by a constant pressure ram and cylinder.

Embodied in the cradle is a tipping table, operated by a direct acting ram, capable of tipping the truck through an

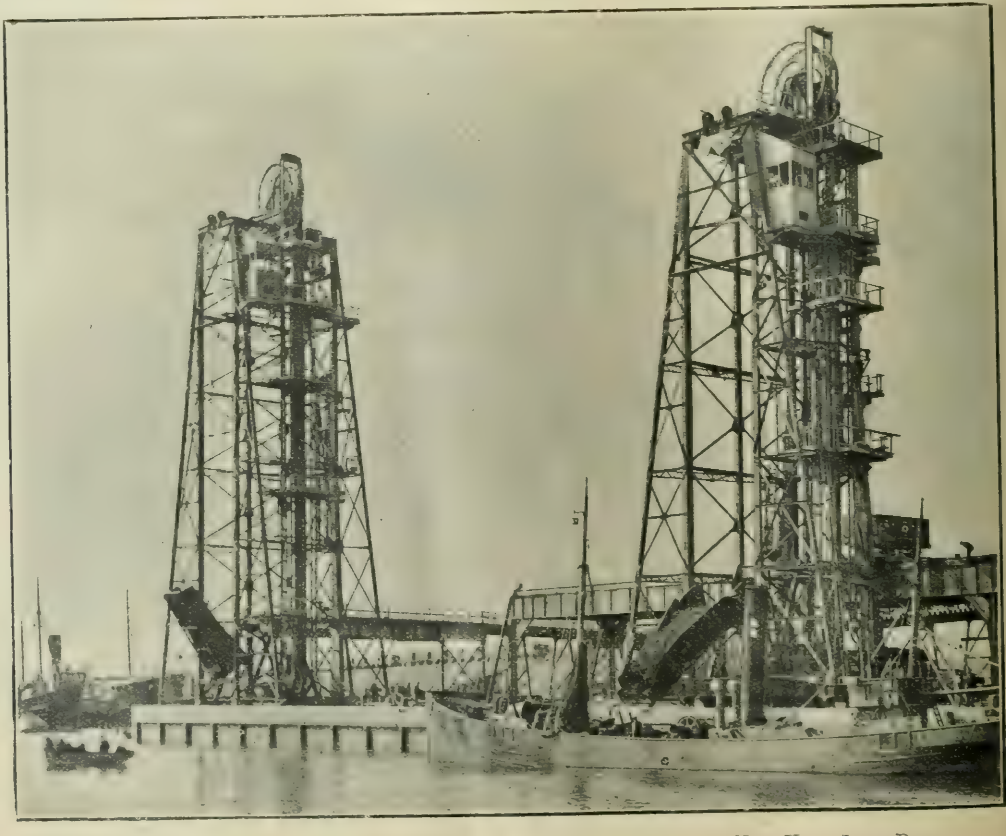


Fig. V.—Hydraulic Coaling Hoists—Right-hand one Movable—at the New Hull Joint Dock.

angle of 45 degrees, and can deal with end or bottom door trucks. The shoot projects 20 feet beyond the face of the quay, and is adjusted to any height or angle and can be swung in a horizontal plane through 12 degrees or about 5 feet on either side of the centre position. Extension pieces to the shoot are also provided bringing the total outreach to 29 feet.

In cases where breakage of the coal has to be more carefully considered, antibreakage boxes are provided, and are handled by the cranes attached to the top of the hoist framing. These cranes have a rake of 35 feet for reaching the far side of the ship. The hoists are operated entirely by hydraulic power, and all motions are controlled from the cabin placed in a position to command a clear view of the shoot and the hold.

Other Plants.

Another modern coaling plant is that at the Immingham Docks, and Fig. 4 shows a battery for 6 coaling hoists. Generally speaking, these are of a similar type to those described above, but deal with 30 or 20 ton wagons up to a height of 70 feet above the quay level. The method of handling the wagons between the marshalling sidings and the hoists is clearly shown in this illustration. The full trucks run down to the bottom of the hoist by gravity, where they are run on to the cradle, raised and tipped. The cradle is then lowered to about 20 feet above the quay, where the truck is run off and gravitates back to the empties sidings.

Fig. 5 illustrates two hoists, one fixed and one moveable at the New Hull Joint Dock. These tips handle 25 to 30 ton trucks up to a maximum height of 72 feet, and each will load 500 tons of coal per hour.

It should be noted that all weights given above are in English tons of 2,240 lbs., and mention should be made of the fact that the coaling plants described above are designed to deal with the usual coal wagons supplied by the railway companies.

We are indebted to Messrs. Sir W. G. Armstrong Whitworth & Co., the makers of this plant, and who have specialised in this branch of engineering for many years, for the excellent photographs with which we are able to illustrate this article.

A PROGRESSIVE MACHINERY HOUSE:

Fraser & Chalmers (S.A.), Limited.

ENTERPRISING COMMERCIAL POLICY.

The name of Fraser and Chalmers has long been one to conjure with in mining engineering circles, and is particularly identified with the Rand since the very earliest days. A great part of the equipment of the first mines of the Rand came from the famous Erith Works of the firm, and it is not too much to say that the name of the machinery supplied to the mines has always been synonymous with reliability and sound workmanship. Through all the different phases of mine buying in these fields from the era of individual purchasing by mine managers down to group buying and centralisation, the firm has maintained its character for fair dealing, and that character has likewise been preserved through the changes in its own staff and personnel.

The Recent Re-organisation.

It is common knowledge that an important change was recently made in the firm, and that the South African business has been taken over by a local company registered under the name of Fraser and Chalmers (South Africa), Ltd., with Mr. W. H. Haig as Chairman and Managing Director. Powerful financial backing has been secured by the new company, and it is the intention to carry on the business on the traditional lines, while, at the same time, broadening its scope to meet the ever-increasing demands of the times. The agencies held by the old firm remain in the care of the new, and their field will be widened by the opening of new branches and the appointment of representatives in centres not formerly directly covered.

In Durban the firm is represented by Messrs. T. Barlow & Sons; and a Nairobi branch, to be known as Fraser & Chalmers—Barlows, Ltd., will be opened in connection with the Durban firm. The new branches include Bulawayo, Salisbury and Capetown, and the intention is to open others as the growing needs of the districts are found to warrant. In appointing managers at their new offices the policy and practice of the firm is to promote the firm's own men to these positions, thereby increasing the attractiveness of the service and rewarding loyalty and merit. The men so promoted are in every case, therefore, engineers who have enjoyed experience on the Head Office Staff, and are best fitted to deal with the problems that may come before them in their districts. The Head Offices of the firm, it may be mentioned, now occupy all the first and second floors of Farrar Building, and are at once commodious, convenient and eminently central.

The Durban Coal Loading Plant.

In another part of this issue will be found a full description of the modern coal loading plant installed at the Bluff Durban, to the order of the S.A.R. Administration by Messrs. Fraser and Chalmers. It is enough to state here that the plant has given the utmost satisfaction and remains a monument of sound workmanship and modern coal loading methods.

Holman Bros., Ltd.

Special reference is called for here to the service offered by the firm to the coal mining industry. In this field the Holman specialities, coal cutters, winches and hoists, are foremost; and are known throughout the coal mining fields of the Transvaal, Natal and O.F.S. Messrs. Fraser & Chalmers are fortunate enough to represent the Cornish specialists in rock drills, coal cutters, air compressors, electric and steam hoists, etc. Holman's works at Camborne, Cornwall, were established in 1839 and have grown very fast during the last 25 years, until to-day they cover many acres, with 1,200 employees. It is doubtful if any engineering works in England is more self-contained than Holman's, as they handle everything from the raw material to the highly finished product. During the War Holman's started their own steel foundry and largely increased the drop forgings works, so that to-day they cast their own steel, iron and brass and do all their own drop forgings, and are thus able to give the Holman guarantee on each article turned out of the works. Holman's expansion in South Africa has been remarkable. In 1905 there were approximately 200 Holman drills on the Rand; to-day this number has increased to approximately 5,000. Users of Holman drills get a reliable "fool-proof" machine, which works day in and day out, year in and year out, giving maximum efficiency at minimum cost. Anyone interested in rock drilling should investigate the merits of the Holman products. Underground and surface hoists for air, steam or electric power are other Holman specialities which have solved many a difficult problem in gold mines and collieries. Messrs. Fraser & Chalmers carry large stocks of drills and hoists in South Africa. With the change over from War work, Holman's have been able to market a range of small vertical compressors, belt or steam driven, which are worthy of investigation.

New York Lubricating Co.

This is one of the few independent oil companies, and about 15 years ago absorbed the Columbus Lubricants Co., and they now control the output of the celebrated "Monogram" products for internal combustion engines, especially motor cars and aeroplanes. More of the big motor races have been won on Monogram than any other. The 12-cylinder "Packard," upon which R. de Palmer was using this oil, attained a speed of 149·8 miles per hour. For the past 16 years this company has been supplying upwards of 50 per cent. of the lubricants for the gold, coal and diamond mines. Probably there is no grease more universally known and used than the New York Lubricating Co.'s famous Rena grease. Colliery managers would be well advised to consult these specialists on all lubricating problems.

Tangye's Specialities.

Messrs. Fraser and Chalmers (S.A.), Ltd., are also the sole South African agents for Messrs. Tangyes, Ltd., of the famous Cornwall Works of Birmingham. That firm's specialities include steam engines and boilers, gas engines and "suction" producers, oil and special engines, steam pumps, power pumps, hydraulic machinery, and machine tools.

It is enough here to state that the engines made by this firm are manufactured in numbers, by specially designed machines and jigs, in order to ensure accuracy and interchangeability. A stock is held, not only of finished steam-tested engines of the most current sizes, but also of the standard details which go to build any of these engines. Special mention may be made of Tangye's improved shaft governor, which is a form of automatic expansion gear designed for quick-revolving engines in which the degree of steam expansion is regulated automatically by moving the eccentric by means of a powerful governor revolving in the flywheel. It is the best and most up-to-date type of gear for engines required to give extreme regularity of speed during large fluctuations of power, such as driving dynamos for electric lighting, either by means of belt or by being coupled direct to the dynamo shaft. A large range of speed variation is permissible, and the parts have wearing surfaces designed for long runs. Mention may also be made of the remarkable economy in steam effected by superheat. This has been dmonstrated, as well as the fact that a considerable amount of success has resulted from its use in Engines not originally designed for it, or which hitherto have been considered unsuitable for anything but saturated steam. A great deal of this success is due to the superior cylinder lubricating oil now obtainable, and which has a flash point higher than the temperature of the steam. Tangyes, Ltd., have made a number of experiments with engines fitted with different types of valves, demonstrating that their engines can be recommended for use with superheated steam, provided that the total temperature does not exceed 400 deg. Fahr. (by total temperature is meant the temperature corresponding to pressure plus added heat), these engines having flat unbalanced slide valves.

Weir Pumps.

The sole agents in South Africa for the well-known products of Messrs. C. T. Weir are Messrs. Fraser and Chalmers (S.A.), Ltd. The specialities of this firm are world-renowned, and it is only necessary here to say that Messrs. Weirs' experience in manufacturing standard sizes and designs has now extended over more than 25 years, during which time they have continuously improved their specialities and methods of production. Standardisation is apt to retard development in any product; but, while conserving the best and most satisfactory features of existing standards, they have never hesitated to revise designs where experience has shown that new features of advantage could be adopted. The manufacturing side of the business has also received the most careful consideration, and by utilising the most up-to-date methods and tools, they are in a position to produce auxiliaries of the highest grade at moderate prices.

The policy has always been to produce the best article, and they have never sacrificed quality or efficiency to cheapness of production. They are convinced that on a basis of actual value their products will be found to represent the best equivalent for outlay on the market at the present time. We mention the excellence of workmanship, the quality of material, and the care and supervision which differentiate the first-class from the lower-grade auxiliary—the factors which, apart from design, give reliability, economy, freedom from breakdown, and all-round good service; but we believe that the long and satisfactory record of service of Weir Auxiliaries in the leading navies and steamship lines, and in many of the most important electric light and power stations of the world, fully support the claims made for their products.

Other Fraser and Chalmers' Specialities.

Space will not permit us to more than mention here the many other excellent specialities, the makers of which are represented in this country by Messrs. Fraser and Chalmers. The names will have to suffice here of Smith's ropes, Baldwin galvanised iron, Thompson's water tube boilers, Ferodo brake lining material, Magnolia antifriction metal, Bessemers' steel forgings, Tripp's steam packings, Bates' expanded steel poles, the Bucyrus dredgers and steam shovels, and Goodrich conveyor belts. These names all stand for pre-eminence in their different spheres and under the powerful aegis of Fraser and Chalmers (S.A.), Ltd., are bound to command a future of increasing usefulness in this country.

Reinforced Concrete.

Messrs. Fraser & Chalmers are also agents for L. G. Mouchel & Partners, Ltd., who are the exponents of the Hennebique system of reinforced concrete, which is known all over the world. There are over 31,000 Hennebique structures in the world to-day. These comprise public and private works, docks, reservoirs, coaling schemes, reinforced concrete ships, of which there are about 80 afloat designed by this firm for H.M. Government during the War. It also includes bridges, warehouse buildings, in fact civil engineering of any description to which reinforced concrete can be applied. Messrs. Fraser & Chalmers are prepared either to advise, design or contract for works of any description in this country.

COALING AT NEW YORK.

THE FUEL TRADE OF A GREAT PORT.

Old and New Methods.

We have given details of the methods of handling coal in South Africa and England and a few notes on the systems employed in bunkering vessels at the largest American port will be of service for comparison.

A City's Coal Consumption.

New York does a great business in coal. The total quantity handled within the confines of the city at the discharging yards of the various railways is over 20 million tons of coal—long tons, that is of 2,240 lbs. But of this large quantity (the quantity handled in 1913 was over 25 million tons) by far the larger fraction is used in the city itself for domestic and factory requirements. Only two million tons were sent to American coastwise ports, and four million tons were sold to the shipping for bunkering needs. This left nearly 20 million tons, or twice the total of the South African output, for the local needs of the city.

Gravity Plants.

Still the handling of six million tons and loading it into ships calls for a large equipment. In America the railroads are privately owned and the harbour coaling appliances are also privately owned. The latter are situated mostly on the Hudson River, as the coal comes from the south and south-west mainly. The railroads do not bring the coal into the city by car loads, but they do bring cars to the river side for the coal requirements of the ships.

This fact and divided ownership has caused a considerable duplication of the coaling appliances of New York. There are about 30 separate coaling plants, all of them with their own particular quay for loading coal. It would be better, one would think, if the State took over the whole task, as congestion and shortage of handling room are pronounced disadvantages at New York, so much so that at various times great schemes to extend the wharfage seaward have been put forward to remedy the inconveniences of the present limited acreage.

Most of these private coaling plants consist of a long jetty or pier running for hundreds of feet into the harbour from the south side of the Hudson River estuary. On these long piers the railroad tracks are laid, the number depending on the width of the pier, which may contain up to four separate tracks. And in most cases these jetties are so arranged as to bring the track level high above the water, say 30 or 35 feet above. This height is not sufficient for the coaling of the big ocean liners, but it suffices for all medium-sized ships.

Unlike the South African trucks the American rail "cars" discharge through the bottom. The coal thus falls by gravity into the storage bins below, and it is from these bins that the vessel is filled, various devices being used to help in distributing or "trimming" the coal in the hold. The cars are about the same size as the larger South African cars, carrying 40 or 50 tons of coal, and some are even larger. But the essential feature of the majority of these loading piers in New York harbour is the use of gravity in getting the coal out of the car and then in discharging it from the intermediary stroage bin into the ship.

How Trucks Are Raised.

Various devices are employed to get the cars on to the elevated roads or tracks. Sometimes the pier is lower at the sea end than at the land end. Sometimes these levels are reversed. Sometimes the trains are brought up a long incline by an ordinary locomotive and sometimes the cars are run up by a special power device, such as a cable or a small pushing truck run by electricity or other form of power.

And gravity is used to get the car back to the rail yard when it has dumped its load, its elevated position at the point of discharge giving the necessary run-down gradient. Vessels can lie on either side of the pier for loading, and can be accommodated at once from the reserves in the bin. There are sufficient separate plants to ensure quick coaling facilities.

It is this reserve of coal in the bins that enables this system of gravity piers to meet the demands of customers. For it can be understood that the long approaches and long gradients to and fro prevent a quick discharge of the trucks. From ten to fifteen trucks per hour is the usual rate of delivery into the bins, which is not up to the six-million-tons-a-year standard, if the number of coaling plants is cut down.

Mechanical Lifters.

In addition to these ordinary jetties the harbour of New York possesses also a comparatively small number of car-tipper plants of the class in use at Delagoa Bay and Durban. These also limit their services to the smaller liners. Their frames are not high enough to reach above the decks of the big European liners, and a separate class of mechanical loader is used for the latter.

The tippers or dumpers are essentially as described in our illustrated sections on the coaling machinery in use at the two principal South African ports, and it is not necessary to explain their action. The lift is a mechanical one, the full truck being lifted, turned over sideways and the whole load of coal emptied on to the "apron" or "pan" of sheet iron above the moveable shoot. The defect of these loaders is, as indicated, the tendency to break up the coal.

Loading Big Liners.

Another class of mechanical loading device is the bucket conveyor with which all South Africans who have visited the diamond or gold mines are familiar. In this case the coal is carried to the ship side in a barge, or barges, and the bucket lift which is usually attached to the ship's side is set in motion by electricity or other power, supplied often by the ship itself. These big boats are also fitted with special apparatus for the distribution of the coal inside the ship. The type of distributor varies, but is usually of the disc or belt class. In each case the buckets dig into the coal in the barge and the ascending stream of full buckets is automatically tipped at the point desired. In these plants it is necessary to have a number of such conveyors in action at once as the quantity of coal required is large and delay is very expensive.

Improvement Wanted.

It will be seen from the above brief description that the handling of coal at New York as in Great Britain is handicapped by the old plants and rights of vested interests that have been established for many years. It should be possible to do better in South Africa, where the best systems can be installed. But a full and competent inquiry ought to precede any extension of the present plants. Our readers are in possession now of a description of the methods employed in the largest coal shipping ports of the world, for it goes without saying that in other British and American harbours the coaling appliances employed do not differ in any special particular from those described. The point to be noted is that gravity systems and mechanical lifting devices are at present most in favour. So far, the use of "grabs" for lifting the coal from the ground or platform has not been popular, as the action of a grab is slow and somewhat uncontrolled. Some remarks upon the whole question are offered elsewhere, as we are informed that it is the intention of the Government to equip the coaling harbour at Capetown with a complete coal loading plant

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LONDON

PARIS

AIR EXPRESS.—Summary of First Nine Weeks' Flying.

Flights Scheduled	**139**	**Interrupted by weather**	**1**
Flights accomplished	**135**	**Interrupted by mechanical Defects**	**2**
Prevented by weather	**1**	**Number of Miles flown**	**34,000**

Average Speed (M.P.H.) - - 106

The following is an official summary of the weather flown through during these nine weeks :

Days favourable for flying	**17**	**Days unfavourable for flying**	**26**

Days noted officially as "unfit" for flying 11

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NATAL'S COAL TRADE WITH THE EAST.

FUEL FOR INDIA—THE GOODWIN REPORT—INTERESTING FACTS AND FIGURES.

India uses a large supply of coal other than bought from Indian collieries. The imports in the pre-War days were supplied by Australia, Japan, United Kingdom and Natal. A large trade has been done by Natal collieries with Bombay, Karachi and Ceylon. The shipments to India, including Ceylon, in 1913, amounted to 263,529 tons, and in 1918 to Ceylon, in 1913, amounted to 263,529 tons, and in 1918 shipments from Durban to India and Ceylon amounted to 153,081 tons, whilst for the first ten months of 1919 67,602 tons were exported. The railway contract with Ceylon railways was secured by two Natal collieries for 60,000 tons some years ago, and a contract with the railways was secured in 1914 to the extent of 30,000 tons.

In 1908 Mr. F. Goodwin, the loco. superintendent of the Rajputana Malwa Railway, was allowed by the Indian Government to visit the coalfields of South Africa to ascertain their capacity, quality of the output, and whether the coal could be recommended in India at a price which would allow it to be profitably used on Indian railways. Mr. Goodwin reported exhaustively on the above points in his report dated 15th June, 1909. He emphasised the importance of importing coal at Bombay for consumption inland in order to provide traffic for trucks that would otherwise return empty on the journey inland to get traffic for export through Bombay, Karachi and Marmagoa.

He mentioned that the consumption of the Bombay-Baroda and Central India railway system amounted to 250,000 tons a year, which would have to be obtained by trucks doing only two or three trips per month to inland collieries, unless coal imported by sea were used. In the latter case, the trucks come to Bombay with remunerative export traffic and go back loaded with imported coal, thus earning revenue in both directions.

He adds that the great Indian Peninsular Railway, the North-Western Railway, and the South Mahratta Railway are in the same position. Bearing this in mind, the railways can pay a relatively high price for coal at Bombay as compared with Indian coal from Indian collieries. Most of the Indian coal, however, is shipped via Calcutta, and if thus carried by sea to the Western ports it is said to arrive in a damaged condition.

The following extracts from Mr. Goodwin's report are instructive:—

" Under these circumstances the railways on the Western side of India have been looking for a source from which to meet their demands under more favourable and economical conditions than those pertaining to a supply from Bengal; and the arrival in India, during the past year or two, of several large consignments of South African coal, the bulk of which has proved to be superior in quality, and has been landed in better condition than Bengal fuel, either rail or sea-borne, and at a price that, after allowing for these advantages, appears to admit of favourable comparison with its Indian rival, has again raised the question whether the South African Collieries could not meet the coal requirements of these railways.

" The South African Government are fully aware that it is on its superiority in quality that South African coal must rely to admit of its competing successfully with Indian coal; while the principal object of the two associations of coal-owners (that respectively represent Natal and the Transvaal), is the barring out from the export trade of all but the best coal.

" During the recent visit I paid to South Africa by permission of the Government of India to report on the collieries of the country, I trust I collected sufficient data to show that the colonies of Natal and the Transvaal possess an unlimited quantity of excellent coal from mines most favourably situated as regards easy carriage to convenient and well-equipped seaports; while the natural formation of the coal seams in Natal, few in number and remarkably free from faults (as compared with the numerous seams of Indian coal, so full of disturbances), points strongly to the possibility of obtaining coal of a uniformly level quality. Moreover, all those South African collieries which aspire to the export trade are replete with the most approved and up-to-date appliances for raising, picking, washing and loading coal. In fact, in this respect, every colliery I visited was a long way ahead of anything I had seen in England, while it is needless to say that the primitive methods in vogue in Bengal have no place in South Africa.

" The constant tests of South African coal that are carried out on the Cape Government Railways, the Natal Government Railways, and the Central South African Railways, and also the records of a series of exhaustive trials undertaken by the Natal Government a short time ago, all prove that South African coal is excellent. The duty it has to perform in its own country is carried out under much more severe conditions as to grades and curves than on any main line or important branch railway in India. Thus the Natal Railway is largely made up of long banks of one in thirty, with 300 feet curves (there is one section with a bank of this description thirteen miles in length); and on the Central South African Railways the ruling grade is one in forty.

" Before going any further, it would be as well to make it quite clear that there are two distinct sources of coal in South Africa, namely:—

(a) Coal from Natal (b) Coal from Transvaal.

Both these coals have their special recommendations, but are quite distinct in character, and belong to different ages and formations.

" Now, the special trials, the actual everyday performance of all sorts of South African coal compared with Welsh coal and Indian coal, the calorimeter tests and analyses all indicate that, for railway purposes, Natal coal is to be preferred for the reason that the average selected Natal coal is quicker burning and much freer from ash than Transvaal. The first is a property that is most desirable in fuel intended for raising steam quickly for fast work in the restricted grate area of a locomotive boiler and the lesser quantity of ash is clearly an important consideration in coal that has to be carried a long way."

EXTENDING DURBAN HARBOUR

IMPORTANT CONSTRUCTION WORK.—THE NEW GRAVING DOCK.—INCREASED BERTHAGE.—ERECTION OF OIL FUEL TANKS.

With a view to meeting the growing demands of shipping on the Port of Natal much important work is now proceeding at Durban. Some little time ago a commencement was made with the construction of a large new graving dock. For this a site has been selected between Congella and Umbilo, where a good rock foundation has been secured. This dock will have a length of 1,140 feet, breadth of 110 feet, and a depth over the sill (or entrance) of 35 feet at low water. The dock will be divided into two sections, so that virtually it will be a double dock, but when necessary it may be used as a whole dock for the accommodation of the largest liners which call at the Union's ports, liners such as the big Australian mail boats and the Arundel Castle, the latest addition to the fleet of the Union Castle Company. Another highly important development in connection with the port of Durban is the further extension of the Congella Wharf southwards. The necessary dredging is now being carried out. On the Bluff side of the port the extension of the wharf in concrete block-work is being continued at the east end of the quay to the extent of 780 feet with accommodating depth at low water of 35 ft. Provision is made for an extension of the wharf by 600 feet to the westward with a low tide depth of water of 40 feet.

Furthermore it is intended to construct other wharves in front of the Esplanade. These will provide berths of 1,150 feet in length for vessels drawing up to 38 feet 6 inches. The task of depositing 33 tons concrete blocks for the protection of the south breakwater has been completed. As soon as the extra berthage on the Bluff side of the port has been completed still more efficient coaling appliances will be installed.

Dredging is also being carried out in connection with the construction of a quay and erection of oil fuel tanks both west of the Bluff quay.

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SOME TRANSVAAL COLLIERIES

SOUTH AFRICA'S LARGE PRODUCERS FOR EASTERN MARKETS.

THE short account we have given of the ports of Delagoa Bay and Durban and the comparative figures added as to the shippment of coal in Great Britain and America will enable our readers to estimate the relative value and modernity of South African coal harbour plants. There is a small bunkering trade done at Capetown, and it is intended to improve the coaling appliances there; but this question of the coal future of Capetown is at present obscured by the controversy as to the advisability of sending coal from the Transvaal by rail to Capetown. The distance is great, being not less than 1,000 miles, and the question is whether land that is railway plant, should be tied up on those interminable miles. Some observations on this Capetown question are offered elsewhere in this number.

A TRANSVAAL COLLIERY SHOWING LARGE STAFFS EMPLOYED. WHITE VISITORS IN THE FOREGROUND.

THE TRANSVAAL'S POSITION.

The next subject, however, in order of place is the industrial position and relative development of the Transvaal coalfields. Some particulars of the coal properties and equipment of certain Transvaal coal mining companies follow. The list is by no means a full one, as these coal mines that are dependen on what may be described as the fixed market of the coal consuming gold mines are exempt from the needs of publicity; their business is as secure as a hard and fast combination can make it. This trust development arose from the chaotic condition of Transvaal coal markets when they were open to an irregular and uncertain competition, a competition that was favoured and made ruinous by the extraordinarily easy conditions of coal mining on the Transvaal plateau, where a minimum of capital enables small private mines to cut at will into the market and disorganise prices and consumption.

The total sales from these Transvaal mines in 1918 was 6,641,229 tons. In 1917 the sales amounted to 6,438,961 tons. The Transvaal was the only Province to report an increase of coal sales in 1918 over 1917, the other three Provinces showing decreases. In 1917 the total sales for the Union were 10,382,920 tons, and in 1918 9,877,325 tons.

The Transvaal coal output is easily first in South Africa, owing to the large markets of the gold mines and mining towns. In bunkering and export trade, however, the Transvaal is less developed than Natal. All Transvaal coal for shipping goes to Delagoa Bay and Capetown. The bunkering sales of coal, mostly Transvaal, at Capetown during 1918 were 329,364 tons. Some Natal coal is also sent overland to Capetown. At Delagoa Bay the Transvaal coal mines shipped 271,040 tons for bunker purposes, and exported as cargo to various ports 511,354 tons. In 1917 the bunker sales at Delagoa Bay were 143,933 tons and cargoes of coal sold 423,537 tons. Thus over a million tons may be deducted from the total of sales given above for what may be termed external demands, leaving a quantity of about 5 million tons for the yearly needs of the mines, power plants and industries of the Province.

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TRANSVAAL AND DELAGOA BAY INVESTMENT COMPANY, LTD.

THE COMPANY'S EXTENSIVE HOLDINGS—COLLIERY OF LARGE OUTPUT CAPACITY—THE DOUGLAS COLLIERY HOLDING.

Board of directors: William Dereham (chairman), Julius Berlein, Stephen Cope Black, Walter John Dold, Spencer Fleischer, Comte F. de Ferrières, Walter Martin Berlein. Secretary and business manager. B. Moses. London committee: Julius Berlein, William Dereham, Frank Smith. London secretary: A. B. Atkinson, F.C.I.S. Head office. The Transvaal Gold Fields Building, 6 Fraser Street, Johannesburg (postal address: P.O. Box 550). London office: 533 Salisbury House, London Wall, London, E.C. Manager at mine: Jas. McPhee, Witbank, Transvaal.

The Transvaal and Delagoa Bay Investment Company is producing coal from two pits—the No. 1, or old, but completely overhauled, plant situated about four miles from Witbank, and the No. 2 plant, which is newer and further distant. The No. 2 plant has a capacity of 55,000 to 60,000 tons per month, and the No. 1 30,000 tons or over, making a combined capacity for the two plants of about 90,000 tons per month, or well over a million tons per annum. As in the case of Witbank, and in fact of all other South African coal mines, the output is determined by the number of railway trucks available for transport of the product and by the strength of the native labour force. There are at present sufficient natives to secure the maximum output, but in point of fact this has never yet been secured, 84,500 tons being approximately the largest output ever obtained in any one month. The T. and D.B. Company employs at present about 1,300 natives and has an admirable system of rondavel locations. This company was, we understand, the pioneer of the rondavel scheme for housing natives in this district. The bunker capacity at the mine is over 2,000 tons. About one third of coal produced at this colliery is "smalls."

Most of the coal cutting is done by hand, but two electric chain cutters (Jeffery and Sullivan) are in use, and it is intended to equip the mine throughout with the first-named type of cutter.

The report submitted to the shareholders at the ordinary annual general meeting held on the 9th Decemebr, 1919, showed that the realised net profit, after deducting estimated Union Government taxes, amounts to £82,357 8s. 2d. Balance brought forward from last year is £107,208 9s., from which is deducted Dividend No. 16 of 5s. per share, £46,250; bonus to directors, £939 2s.; and provision for further electrical installation, £15,000; leaving £45,019 7s., and making the total to the credit of profit and loss account £127,376.

The directors recommend that a dividend of 5s. per share 25 per cent., be paid, free of Union of South Africa Dividend Tax. This will absorb £46,250, and leave a balance of £81,126 15s. 2d. to be carried forward.

The financial position is most satisfactory. Cash and equivalent assets, less sundry creditors, amount to £152,601 3s. 3d. The British 5 per cent. War Loan remains at £25,150, and the holding in Union of South Africa 5 per cent. Local Registered Stock (free of income tax) has been increased to £45,000. Shareholdings now figure at £91,514 16s. 11d., and include practically the entire issued capital of the Douglas Colliery, Limited. The directors consider this acquisition as being of great advantage to the company, and likely to prove a very valuable asset. The Transvaal and Delagoa Bay Collieries, owned entirely by this company, produced 807,500 tons of coal, an increase of 49,791 tons compared with the previous year. Notwithstanding this increase, profits have been somewhat smaller on account of higher cost of production.

With the termination of the War, the previously existing difficulties in obtaining new equipment are lessened, and it should now be possible to procure electric coal cutters and proceed with additional electrical and power installation. A further £15,000 has been set aside, and this sum with the balance of £8,210 12s. 3d. still unexpended will, it is estimated, be sufficient to complete this work. Machinery, plant, buildings and railway have been maintained in good condition. The sum of £8,215 13s. 2d. has been written off for depreciation. Capital expenditure totalled £3,073 2s. 4d., including an additional electric coal cutter, further accommodation for white and native employees, and extension of water service. There is no change to record in the width the seam and good quality of the coal.

The examination and prospecting of several properties held under option were continued during the year, the costs incurred being written off.

During the year the surface rights of one farm in the Waterberg district were sold, the mineral rights being retained. Two freehold farms in the Middelburg district and Rustenburg district respectively were purchased; also mineral rights on two farms in the Potchefstroom district. The option on the farm Weltevreden, in the Pretoria district, was abandoned.

The following is the schedule of the company's holdings: Farms, freehold, full interest, 61,619 acres; farms, freehold, undivided half interest in 96,012 acres; farms, mineral or coal rights only, full interest 28,664 acres; farms, mineral rights only, undivided half interest 21,873 acres; farms, leasehold or under option, full interest, 1,054 acres.

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THE UITKYK COLLIERY.

THE TRANSVAAL MINE AND THE NEW NATAL VENTURES.

It is a curious fact that the coal prospector of the Transvaal looks for the coal beds at the highest levels of the uplands lying east of Johannesburg. If he gets down below 5,000 feet altitudes he is usually below the horizon of the coals. Hence where the country falls away to the north the outcrop level of the coals is soon reached and passed, all the lower ground being destitute of coal as it is made up of rock strata laid down in a period before the coal beds.

Of all these elevated points along the railway line, Uitkyk is one of the highest. The word means "Outlook." The town of Middelburg, which lies a few miles beyond, is several hundred feet lower, but nevertheless records 4,980 feet above sea level. Uitkyk is about 5,600 feet up and its coal bed is only 140 feet below the ground surface. The position is elevated enough, so that both the Rand market and sea market at Delagoa Bay can be reached without any expenditure of energy in lifting the loaded trains.

Coal Area and Plant.

The colliery at Uitkyk has been extensively developed and considerable sums of money have been spent on it. A large coal area is owned in freehold. This exceeds 5,000 acres. In addition 800 acres of coal-bearing land is held under lease. A big three-compartment shaft opens up the coal seam worked, which varies in thickness from 6 feet to 9 feet. There is a gallant and lofty headgear, with its attendant winding engine, whose winding drums are nearly 20 feet in circumference. The sheaves are 6 feet in diameter. All this powerful plant is energised by steam from great Lancashire boilers capable of generating 1,200 h.p. even when fed with small coal. Over 30,000 tons of coal can be raised every month, or more than 1,000 tons a day.

To meet the projected requirements, the mine was developed on a comparatively big scale with long main roads equipped with mechanical haulage electrically driven. The needed feeding connections were opened up on a corresponding scale. Nearly ten years' work has been done on this coal area, the company having been registered in 1909. The coal is cut with Siskol and Hardiax cutters, and the air compressor plant can supply 26 of such machines. The power used throughout is electricity, which is more convenient than steam-driven belts or ropes.

A New Mine.

As regards the mine, it has reached an interesting phase of its development. The plant is grouped about the shaft, which is situated on the south side of the railway line and siding. There are certain public regulations regarding sub-railway mining, and the mine was developed accordingly exclusively on the south side of the railway line. But as time went on the coal developed did not quite reach the demanded calorific standard of the railway and the shipping trade. It was an unexpected circumstance that the board was naturally unwilling to accept as permanent, as such acceptance meant the virtual abandonment of the wide development carried out in advance to meet the requirements of customers. But finally it was necessary to accept the logic of facts and exploit another section of the mine.

The coal was better on the north side, where the railway bar lay. So the necessary permission to drive a main hauling way through the coal underlying the railway reserved ground was obtained and work began on the north section of the property. Here the needed quality of coal of 12·5 is obtained, and the general manager on the property, Mr. H. W. Pursglove, has been busy for months past in opening a new mine in the higher grade coal. To find out the position of the seams, boreholes have been sunk, and these show not only that values are maintained but that the beds are thicker. They lie a little deeper, some 200 feet in all, and the total width of the coal beds is about 20 feet. There are two seams according to borehole evidence. They are of higher calorific value than the coal in the south mine, which is a little—not a great deal—below the standard called for.

The 12·5 Standard.

This experience of the Uitkyk is interesting, and emphasises the points we make against the policy hitherto pursued by the railway control. The main point is that 12·5 values are too near the upper limits of these Permian coals; some better plan, more in keeping with the facts and the interests of the State, must be adopted. In the case of the Uitkyk it has been possible to open up a new mine by extending in another direction from the present shaft, and this work of exploration and development has been carried out within the last five months. But other mines may not be so fortunate. In a large acreage a new mine means usually a new shaft and an expensive shifting of heavy plant and machinery requiring a large outlay on foundations alone. Usually such a crisis means the closing down of the mine. For example, the Uitkyk Colliery has expended a considerable sum in putting up a large bin for the storing of mine coal. It is made of Oregon pine. Its height is about 50 feet to enable the railway trucks to be filled by gravity from this coal reserve. This bin holds 4,000 tons of coal and is equipped with a distributing belt system that fills up at any point where necessary. A monster bin of this character would demand much money for its removal, and the company is fortunate in having escaped this contingency by the discovery of better coal values in the hitherto undeveloped north section of the mine.

THE UITKYK COLLIERIES, LTD., BECOME THE TRANSVAAL AND NATAL COLLIERIES, LTD.

Recently the Board of the Uitkyk Collieries decided to expand the company's chances and business. It is an early invader indeed of the field of new possibilities which it is the business of this number to bring to public notice. The company's engineer was sent out to report upon certain Natal (Vryheid) coal farms over which options had been secured by the South African Committee of the company, of which the Hon. H. A. Wyndham is the present working member. Lt.-Col. C. L. Andersson, his colleague, has been out of business for some time, having been detained by the Germans as a wounded prisoner.

These new farms lie on the immediate extension of the properties of the Vryheid (Natal) Coal and Iron Company, whose property at Hlobane is described elsewhere. The reporting engineer, Mr. B. Madew, states that he visited the ground in 1917 and found the three chief coal seams of the district exposed for long distances round the sides of the mountains. He estimated the coal contents of these three seams at a hundred million tons, and the analysis he gives may be accepted as representative of the value of the coal which is of similar quality to that developed in the growing coal industry of the Vryheid district.

This analysis is given here.

Moisture	2·03
Volatile matter	18·10
Fixed carbon	67·83
Ash	12·63
Combustible matter	85·9
Calorific value	13·9
Nitrogen	1·9
Sulphur	0·81

Mr. Madew states that the coal values are above the average quality of British coals. Working these adit mines will be easy and costs will be low.

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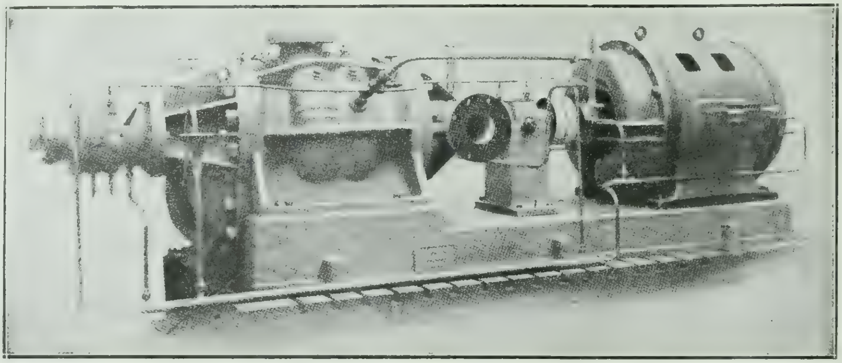

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THE FINANCIAL CHANGES.

Having acquired these important properties, the Board called the shareholders together in November and asked them to pass the following resolutions:

(1) That the rights and privileges attaching to the cumulative convertible preference shares No. 100,001 to 175,000 inclusive shall cease and shall be deemed to have ceased as from the 3rd December, 1916, as from which date such shares shall be and rank, and shall be deemed to have been and to have ranked as, and *parri passu* with, the ordinary shares of the company.

(2) That the capital of the Uitkyk Collieries, Ltd., be increased from £175,000 to £500,000 by the creation of 325,000 new ordinary shares of £1 to be numbered 175,001 to 500,000 inclusive.

(3) Subject to the consent of the Board of Trade, that the name of the company be changed from "Uitkyk Collieries, Ltd.," to "Transvaal and Natal Collieries, Ltd."

CAPITAL RE-ARRANGEMENTS.

In explanation of the notice circulating these resolutions, the Board issued a circular explaining the proposed changes in the company's assets and prospects. The price to be paid for the properties is 91,000 fully paid £1 ordinary shares of the company.

The cost of equipping the new mines, estimated to produce 1,000 tons a day, will be about £150,000.

The preference shares having been converted into ordinary shares, the financial scheme works out as follows:

Original capital	£175,000
Proposed increase	325,000
	£500,000
This would be distributed as under:	
Ordinary shares already issued	£78,896
Conversion of 8 per cent. preference shares	75,000
New issue of ordinary shares to be made for cash to repay bank loans	65,000
Purchase price Natal mines, paid in shares	91,000
	£309,896

Thus 190,104 shares remained, and of this unissued capital it is proposed to issue £150,000. For this money negotiations were proceeding at the time the meeting was called, with certain financial firms. "Arrangements," proceeds the circular, "are being made for the sale of the output (of coal), but it is obviously undesirable at the present time (October, 1919) to indicate more fully the position under this head."

THE PROSPECTS.

In Natal it is thought that there is enough ground and coal for two additional collieries to be opened in addition to the proposed colliery which is to be opened at once. Mr. Madew, the company's engineer, will come to South Africa and reside here for two years to erect the new plant and develop the new mine to produce 1,000 tons per day.

The Uitkyk Collieries has thus expanded recently and is now about to establish itself in the fashionable Vryheid district. But the Transvaal colliery will also, as we have shown, be in a better position to meet shipping and mining demands. It can produce 300,000 tons a year on a single shift per day with the plant we have mentioned in the first half of this account.

The last point is that the name is to be changed to fit the larger scheme. Uitkyk Collieries has become the "Transvaal and Natal Collieries, Ltd."

The personnel of the company will be re-arranged also. Lt.-Col. A. St. John Cooke, D.S.O., continues as chairman in England, but the local committee in South Africa disappears and Mr. B. Madew will be the new representative of the company here.

The local secretaries, C. L. Andersson & Co., also continue as before at their offices in Harrison Street, Johannesburg.

THE KENDAL COLLIERY COMPANY.

A PRIVATE MINE—THE LIMITS OF THE COAL FIELDS.

OUR account of the lagoon-like character of the High Veld coal deposits of the Transvaal, particularly in the Witbank area, will explain why the property of the Kendal Colliery on the farm Heuvelfontein is like many others an isolated coal area. On the south and west it does not extend to any distance; but on the north it is continued toward the Pretoria railway line and Balmoral coal mine.

THINNER COAL BEDS

It is at this point that the marshalling yard of the Union Railways will be established for collecting and distributing the trucks for the Witbank coal area as explained in the article we publish on the Railway programme. At this point the coal beds are less developed than they are further to the east. In the Kendal Mine the coal seam worked lies 80 feet below the surface, and is over all nearly 10 feet thick. Below it, 50 feet deeper, there is another bed of coal which is 4ft. 6in. thick. These combined seams make the coal at this point only 15 feet in thickness, though it is possible that this thickness increases in other parts of the large acreage held. For the 810 acres of Heuvelfontein are only a part of the leasehold; there are 1,500 acres of an adjoining farm also held under contract as regards the coal rights. The two farms together make an acreage of 2,300 acres.

METHODS OF WORKING

Of the coal seams only 6ft. 6in. of the upper seam is worked. The company is a new one and has not yet put in coal cutters. All the coal is got by blasting, using hand-drillers to drill the holes. The coal being harder than usual does not suffer to the extent that more friable coals would do. Still a considerable quantity of fines is made. About 60 per cent. is large coal, 20 per cent. nut coal, and the balance peas and duff. All is sold, the large coal and nuts to the mines, and the fine stuff after screening is taken by the Victoria Falls Power Company or other large users.

There is a railway siding, put up as usual, at the company's expense; but in this case the mine is only 400 yards away. A mechanical haulage system operating through an incline shaft raises the coal to the necessary level for screening. Gravity suffices to run the filled trucks to the railway. The coal, after being tipped into the screen, is carried forward on a picking belt, where the small shale content is picked out by natives. As regards the balance of the coal it is classified in separate hoppers for separate loading into the railway trucks.

In this mine, which has an output of 9,000 tons a month, with a possible output of 12,000 tons a month, not much power is required owing to the flatness of the coal bed and its shallow depth. Three boilers of loco type, aggregating 60 horse power, are used to supply steam, which is generated in nut coal furnaces. The chief expenditure of power is in the mechanical haulage and movement of the coal as

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the water content is not great and the lifts inconsiderable. As stated, the coal is won by native miners, and no air compressor plant is installed.

Blasting Coal.

There are two main hauling roads in the mine. The pillar and stall system is employed, mining with 20ft. pillars, 20ft. stalls, and panels of 200 feet. Eleven drilling "boys" or natives break out sufficient coal to keep 10 loading boys constantly employed. The wages are paid at the usual Rand standard, and lodging and food supplied. Huts are used to lodge the boys instead of the large compounds common on the gold mines. The majority of the native miners are from the East Coast, that is Portuguese territory. About 200 men are employed.

The Commercial Side.

As this private company is a member of the Transvaal Coal Owners' Association, all its commercial business is done through the Association, the principle of the combine being to allocate a definite percentage of the demand to each member who benefits only through the general increase of business, and is not concerned in the variations of domestic and industrial demands. Each member is thus able to calculate his profits with exactness when he knows the quality of his coal and the amount of his working costs. The price varies with the analysis of the coal supplied, a higher calorific value than 12·5 being paid for at a higher figure than the standard price, while a corresponding reduction in price is made when the analysis shows a lower value than the standard. The only field for variation is the expenditure per ton of coal won. In the circumstances this associated coal mining is as exciting as winning salt from the Dead Sea. Even the War did not disturb the even tenor of the way of the coal miners. They have benefited little if at all from any increase of prices, while on the other hand there has been a rise in operating costs. The War benefited the Natal coal miners, who obtained nearly 100 per cent. increase in prices—with corresponding results on the development of the Natal fields, where new railways have been built and modern by-product plants are being installed out of war profits.

In the Kendal Colliery the active spirit who is in control at the mine is Mr. R. G. Voss, who is an old School of Mines graduate. Mr. Rogers is the mine manager.

The point of general interest in this enterprise is the evidence it gives of the limits of the higher classes of coal of the Witbank area on the West. There are several small concerns operating on what may be called the East Rand coalfield nearer Johannesburg, but the general average of the coal as one comes westward is lower when regarded from the steam-raising standard. This coal deposit also connects up the Witbank area indirectly with the Balmoral area lying on the north towards Pretoria, thus giving the approximate outlines of the High Veld coal area in this direction.

KROONSTAD COAL ESTATE COMPANY, LIMITED.

A FREE STATE ENTERPRISE ON WHICH THREE SQUARE MILES OF COAL HAVE BEEN PROVED.

Issued capital, £110,500. Directors: Frank Stewart Lynch (Chairman), William Henry Carter, Friedrich Hirschhorn, William Pickering (alternate), Joseph John Trigunner King, Alpheus Fuller Williams, John Harbottle (Alternate).

The property of the Kroonstad Coal Estate Company, Ltd., is situated within one mile of Veirfontein Station, on the main line, Klerksdorp to Kroonstad. The extent of the estate is 65,000 acres, cut up into suitable farms, on which latter are planted half a million Rostrata gum trees, and in addition many thousands of ornamental trees, all of which are in a flourishing condition, and should prove to be a very valuable asset to the company within a few years. Last season approximately 30,000 bags of maize were reaped off the estate. There are 20 boreholes on the estate. In addition to coal mining and farming, a trading store is conducted by the company, and at the present time is in a flourishing condition, and is situated near the mine.

Depth of Seam, Thickness, etc.

The coal area proved is approximately three square miles. Thicknesses of seam average 7 feet 6 inches of clean coal; free from gas, faults, etc.; sand-stone roof "good", depth of strata to seam, average 90 feet vertical. Method of working: "Pillar and Stall." No machines are used, and the coal is conveyed to surface by the "endless rope" method. There is an incline shaft leading to the mine. A prospect shaft has been sunk at a point about two miles south of the old workings and a new mine is being opened up here where a good grade of coal exists.

Surface Arrangements.

The coal is tipped, after landing from the mine, on a travelling belt and is then picked. Two classes of coal are produced, viz., bulk and nut. The fine coal is "dumped" as waste. The main machinery on the property is as follows: One Robey 40 horse-power hauling engine; two Babcock & Wilcox boilers; one Cook boiler; one generator for lighting underground, and to supply power for two electric pumps; one Screen steam engine, etc., etc. Water gravitates to main pumps near the shaft and is pumped direct to surface. About 95,000 gallons are pumped daily.

Kroonstad Coal Estate: Photo of Headgear before being roofed in. Incline Shaft leading to Mine.

VENTILATION

This is natural. The mine is well ventilated, and when occasions arise a ventilation shaft is put down.

MARKET

De Beers Consolidated Mines, Beaconsfield, are the company's chief customers, and also Klerksdorp Municipality Power Station. Vaal River Salt Works (Britten) are also

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large customers of this coal. At present operations are hampered by a shortage of native labour.

Staff.—H. Owen, General Manager; Geo. Whitelaw, Mine Secretary; Geo. Stone, Engineer; C. H. Webster, Farm Manager. The Company's Secretaries are Messrs. Salisbury & Beaton, Box 245, Kimberley.

Analyses.

Ultimate analyses on nitrogen contents of the company's coal made are: Nitrogen contents equal 1·24 per cent., which equals 112 lbs. of ammonium sulphate per 2,000 lbs.

Prox. Analysis.

	Per cent.
Moisture	8·29
Volatile matter	31·27
Fixed carbon	45·32
Ash	15·12
	100·00
Sulphur	1·43

Calorific value by Mahler bomb in British thermal units, 11·4 compared with test made near the outcrop a few years ago, which showed 9·89, which shows a marked improvement in the quality.

TWEEFONTEIN UNITED COLLIERIES.

A BIG BUSINESS AND SOME BIG PLANS.

Under this name three coal mines were recently combined as the property of a single company. These mines were the Oogies Colliery, the Tweefontein Colliery, and a developing mine known as No. 1 Area, opened by Henderson's Consolidated Corporation. The trio now form one of the largest producing coal properties of the Transvaal with an output exceeding a million tons of coal a year.

The Oogies Colliery was floated with an issued capital of £130,500 at the end of 1917, the property acquired being the Oogies coal mine with its land and coal rights and mine plant. This company increased its capital in 1918 and took over the Tweefontein property and colliery, together with No. 1 Area. The area of land was thus increased to 15,000 acres freehold and 4,900 acres coal-rights, the latter area representing coal-right owned. Thus the United Tweefontein Collieries as floated in 1918 owns the freehold and coal rights of a block of about 20,000 acres situated on the railway line between Johannesburg and Delagoa Bay and is the nearest to the Rand of the main coal producers. The original Tweefontein Colliery, Ltd., became in the course of these changes a holding company.

Some Figures.

With the acquisition of the additional collieries the capital of the company was raised to £650,500, of which 500,500 are ordinary shares and 150,000 shares are preference. Not all these shares were issued at the time. Options were granted on the unissued shares, and these options have not yet been fully exercised. At the date of the latest balance sheet, made up to 30th September last, 516,810 shares were issued, the unissued balance consisting of 67,250 ordinary and 66,440 preference shares. The options on these shares expire in May of this year, before which date it is probable that the shares will all be taken up and the whole authorised capital will then be issued.

The Value per Acre.

The assets acquired by the company included the development of the three collieries valued at the time of purchase at £296,379, but now increased to £300,859. Another main asset was the landed property and its mining development, valued together at £244,381. This valuation is about £12 an acre. Stores, sundry debtors and cash amounted to more than £60,000. On the other hand the loan account—which will be extinguished by the ordinary shares yet to be taken up—amounted to £67,000, and sundry creditors to nearly £18,000.

Financially, therefore, the company is in an unassailable position with a large surplus revenue that amounted in the company's last year to £37,366, and considerable cash reserves "in being." It is intended to make use of this financial strength to make better use of the coal assets of the company.

Another Range of Values

But after all the figures quoted give only a superficial summary of the company's position. Assets such as a magnificent climate with bright sunshine at a high altitude, and, further, thousands of acres of agricultural land that can with ordinary fertilisers produce sufficient to raise the surface value of the land to £12 an acre are not reckoned at present. Yet they are there, and the proposed scheme to take out the nitrogen content of some of the coal seams will demonstrate these dormant values in striking fashion. The land is within the 28-inch-a-year rainfall, and in addition there is a valuable right to pump water from the Oliphants River. The latter has been acquired in view of a possible extension of the company's activities to the production of various coal by-products.

The Coal Assets.

Surface values are growing in value with the settlement of the country and are therefore worthy of mention. But the real asset lies in the immense coal reserves. These beds lie at very moderate depths and at the two main collieries on Tweefontein are attacked from incline shafts. The beds of coal lie practically horizontal, and the thickness and solidity of the main coal seam worked is an advantage all in keeping with the extremely favourable conditions that attend coal mining in the higher Transvaal coal districts. In addition it should be realised that the seam is some 20 feet thick and with its accompanying beds gives a depth of coal over the greater portion of the property of 30 feet of coal. Only 9 feet of this coal is sold. for though 12 feet are mined there is a band of inferior coal that is rejected in the sorting and classifying sheds.

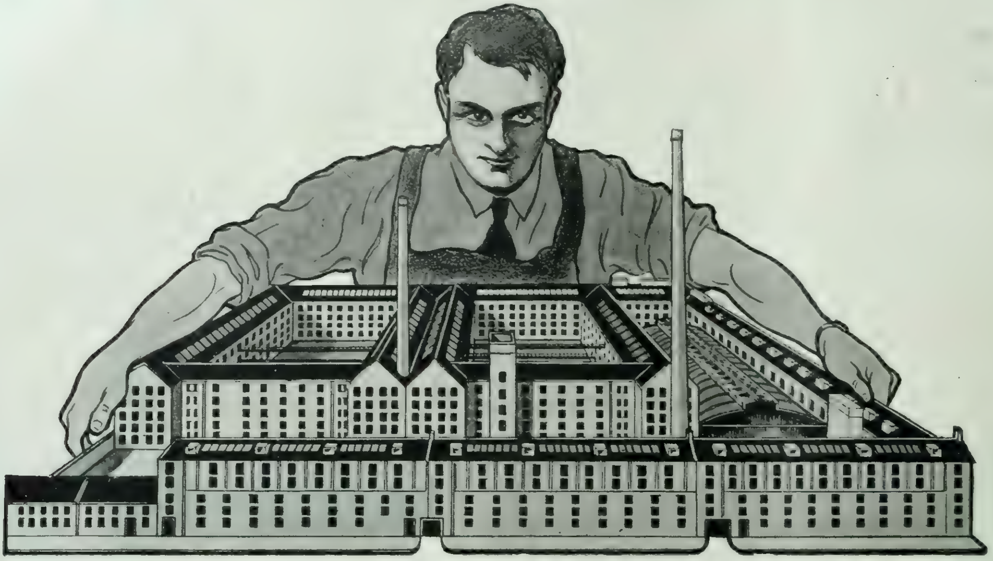
200 Million Tons.

In the circumstances it is necessary to refer to the technical reports made by competent engineers concerning the available coal reserves. The capable chairman, Mr. Wm. Pott, stated at the last general meeting of the shareholders that in the Oogies mine there was certainly seven and a half millions of first-quality coal, "and possibly a good deal more." On Tweefontein and Waterpan, two of the farms, fifty million tons of best-quality coal had been proved by boreholes and mine development, and in addition there were 150 million tons of second quality.

Now while these statements are strictly correct they do not give quite a reasonable view of the probable coal content of the company's properties. The experts who put forward these figures leave large areas unestimated. The Tweefontein estimate of fifty million tons includes the two farms of Tweefontein and Waterpan, or about 13,000 acres only, while the smaller estimate of seven and a half million tons limits itself to about 700 acres. In other words, the farms over which the coal rights are owned, measuring about 5,000 acres, are not included at all. Further, all coal on Tweefontein and Waterpan west of an arbitrary line, which is fixed by a few boreholes, is also excluded as the boreholes gave somewhat lower calorific values.

Another Estimate.

Bearing these facts in mind, the data respecting the coal seams as set forth in Mr. Simon's technical report on



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the probable quantity of coal on the two farms mentioned will be better understood. It is important that all the possible facts should be collected as the calculations as to the coal contents of the various coal fields of South Africa are profoundly affected by the drastic reductions common in engineers' reports.

"Mining at Tweefontein Colliery," says Mr. Simon's report, "has on the whole been confined to the main seam owing to the cheapness of working. The marketed coal is of guaranteed 12·5 calorific value by Mahler's bomb, which is the standard value of the coal sold in this district, and which I term commercial coal.

"Some mining was done in the lower seam, where it averaged 5 ft. 4 in. in thickness. But in practice it is found that the cost of mining this coal was higher than the cost of mining the main seam, although the calorific value of this (lower) seam runs about 13·0 by Mahler's bomb. The appearance was against it, being dull and splinty.

"You have likewise proved by a trial shaft and boreholes the upper seam, which averages 9 ft. in thickness, but this is of a lower calorific value, viz., 11·5 by Mahler's bomb. Nevertheless it is a valuable seam as such, as it is a big asset as a source of supply of ordinary commercial coal once the calorific standard is reduced."

Here, then, are three seams of coal, the top seam measuring 9 ft., the middle nearly 20 ft. (of which 9 ft. is actually taken out and sold), and the bottom seam 5 ft. in thickness. Taking the middle seam at 12 ft. only, the actual width of the three coal seams is 26 ft. with a calorific value all over of about 12·0. The boreholes give a higher average thickness, but taking a tonnage of 1,600 tons per acre per foot of coal, 26 ft. will give, say, 40,000 tons of coal per acre, a figure which may be accepted as approximately the theoretical quantity. A hundred acres on this figure would contain four million tons of coal and a thousand acres forty million tons. Thus five thousand acres would on these figures contain 200 million tons, or about the same quantity as is estimated by the company's experts to be in the whole property of twenty thousand acres.

COAL RESERVES AND WORKING METHODS.

We mention these figures as they give support to the general estimates we put forward elsewhere of the coal content of the South African coalfields.

It is necessary to call attention to these discrepancies between theoretical and estimated coal quantities. The final result, of course, depends on the methods of mining and the methods of using coal. Beds lying near one another can be worked out and thick beds can also be taken out. It is not necessary to leave 40 per cent. of a coal mine standing, nor is it necessary to throw away 10 or 15 per cent. or more of the coal actually mined. Still less is it necessary to discard all coal below 12·5 values.

THE MINE'S LIFE.

But leaving this point as open for controversy and reverting to the particular case of this colliery, it is enough to say that the official estimate of 200 million tons is conservative, as the mine is very free from dykes and ground movement pressures. Even accepting 50 million tons as marking the life of the mine, the life is 50 years at one million tons a year. This is all that the shareholders need estimate upon at present. It is intended, however, to increase the output, and for this purpose the new mine at No. 1 Area will be rapidly opened up. This mine is situated near the Tweefontein Colliery but opens up the coal beds on the opposite side of the valley. All its plant, however, will be operated as far as possible from the central station.

As a colliery producing coal for steam raising purposes, Tweefontein United is second to none. The amalgamation of the three mines means cheaper working, more concentration, and the mining of the coal on the most advantageous conditions. Supplies of agricultural products are obtained from the tenant farmers, and to meet the demand for timber 500 acres of wattles exist. It is therefore merely a question of markets and better and more settled labour conditions and the commercial prosperity of the company is certain.

THE DISTRIBUTION OF THE COAL.

But the demand so far has not shown much expansion. The colliery is a member of the Coal Owners' Association and is allotted 20·16 per cent. of the estimated total monthly sales of the Association. In order that the division of the coal supply between mines, shipping and public may be estimated, we print the following analysis of the distribution of Tweefontein mine sales during 1917:—

Sold to.	Tons.
South African Railways	144,000
Diamond mines	10,000
Gold mines	138,000
Table Bay (bunker coal)	28,000
	320,000
Transvaal industries	29,000
Retail trade	95,000

It is necessary to say, however, that each large colliery has its special customers, the Railways being large consumers of Tweefontein coal. A short line of railway connects the mine with the main line.

THE BY-PRODUCT QUESTION.

Before concluding, a reference to the future plans of the company is necessary. In his speech already referred to, Mr. Pott indicated the line of the company's policy with regard to the large questions raised recently by the movement to secure higher values from coal. He said that the "Board was so impressed with the frightful waste of valuable assets in the discarding of such large tonnages" that a decision has been taken to erect a by-product plant. This has been ordered, the Lymn-Rambush process of coal distillation being adopted, with the object of extracting the nitrogen contents of the coal as ammonium sulphate. The nitrogen in Tweefontein coals averages 1·5 per cent. In this process the coal is driven off as gas, and it is thought a use can be made of this gas possibly for power purposes. "While an iron industry," said Mr. Pott, "will undoubtedly be established here in time, and may be a large customer of electric power, generated as I have indicated from waste gases of by-product plants such as we are erecting, I look to the Railway becoming our first customer."

The first plant, consisting of two retorts, will have a capacity of 40 tons of coal a day, and if the coal is found to be suitable and results warrant, a number of other retorts will be added. The plans allow of indefinite extension and all the necessary water required will be provided. There is a storage dam holding 234 million gallons and in addition, as stated, pumping rights on the Oliphants River.

The idea behind this new departure is to utilise the immense tonnages of lower quality coal. The prospects of this new enterprise were summed up by Mr. Pott in a couple of sentences.

"We have," he said, "unlimited water supplies, unlimited coal, unlimited surface sites, and a coal higher in nitrogen contents than most English coals which cost Home by-product manufacturers three and four times as much as ours will cost."

"Your company alone will in time be quite prepared to produce 1,000,000 tons per annum for by-product use only, and it will do this at an unusually low price."

The directors of the Tweefontein United Collieries are Mr. Wm. Pott (chairman), Mr. John Davidson and Mr. S. Thompson. The mine manager at the Tweefontein Mine is Mr. J. M. Martyn, who succeeded Mr. Simon, recently deceased. At Oogies the manager is Mr. W. H. Walters. The secretaries are Henderson's Transvaal Estates, Ltd., and the head office is B. & T. Buildings, Commissioner Street, Johannesburg. The original Tweefontein Colliery, Ltd., it should be noted, is now a holding company. Its chairman is Lord Oranmore and Browne, K.P., and the London offices are at 36 New Broad Street, E.C.

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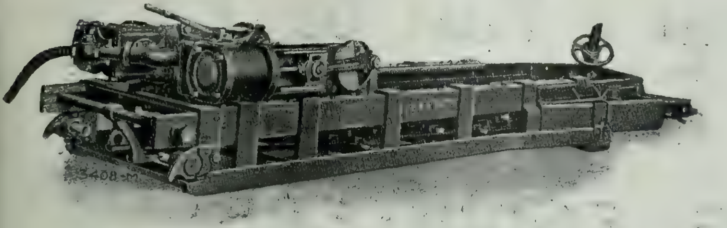

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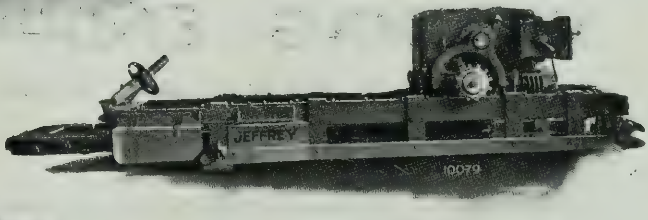

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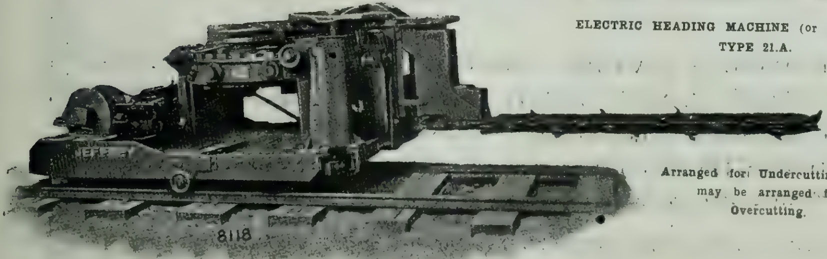

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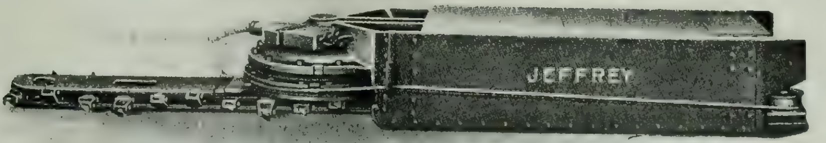

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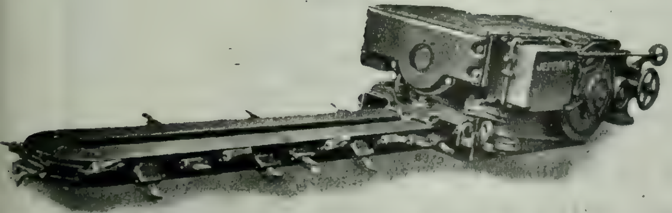
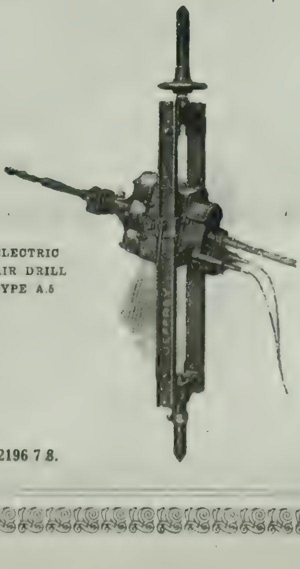
TYPE 24.A.



ELECTRIC SHORT WALL MACHINE (or Compressed Air).
TYPE 35. B.



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THE CLYDESDALE (TRANSVAAL) COLLIERIES.

A PIONEER COAL COMPANY.

On the Rand the name " Clydesdale " is synonymous with the word " coal." It is a household word. A quarter of a century ago when the gold mines were in the halcyon days of risk and glorious uncertainty about values and the future, Clydesdale (Transvaal) Collieries, Ltd., were incorporated. The date was 12th September, 1895, when the share boom was most violent and " the Raid " more than a year distant.

The Directors.

The names of the directors of this pioneer coal company, whose creation marked a distinct advance in the coal history of South Africa were:

Mr. Mackie Niven, Chairman.
Mr. Dundas Simpson.
Mr. W. Hutchison.
Mr. A. H. Walker.
Mr. A. Herzberg.

The managing director was Mr. Dundas Simpson, who now watches and takes a fatherly interest in South African coal from afar—his home being somewhere in the mists and fogs of the north. Mr. Mackie Niven, however, is still the active South African chairman of the company, and only a few weeks ago referred to the possibility of creating a larger iron and steel industry in South Africa as a subject of interest for present-day shareholders. The Clydesdale company will doubtless take a place in any such advance, and move as in the past in the van.

The Old Mine.

The original mine was opened up on a purchased portion of the farm Daggafontein, a farm whose name is now barked aggressively on stock exchanges as the title of a large gold mining company. For the gold beds of the Rand with the Main reef among them lay below the later horizontal coal seams on the farm. In all, about 1,300 acres were bought. One half of this area was at a later date sold to the Cassel Colliery. Lately, however, the two twins have come together again. Having jointly extracted the coal—some of it—they have joined in a venture to extract the gold. But as the owners' share of 1,300 acres does not give space enough for a modern deep level gold mine an application has been made to the Government for some additional gold-bearing ground—the minerals mostly belong to the State in the Transvaal.

To meet this contingent gold fall a new company—the Cassel Clydesdale (Springs) Gold Mines—has been formed with a capital, to begin with, of £300,000. When the additional ground has been obtained the task of getting out the gold will begin, and the company will later enter the ranks of the gold producers.

The old coal-bearing area has therefore done well for its pioneers. It was worked for coal from September, 1895, to 30th September, 1915—just twenty years. Beginning with a small output, it produced during its lifetime 2,755,615 tons of coal for the market. Out of its productive life, however, some three and a half years—1899-1902—of war must be cut. Being only 30 miles from Johannesburg and only a few miles from the Eastern Rand gold mines, its near-by position helped it to make good returns to its shareholders.

A Coal Basin.

Some interest attaches to the coal beds of that gold-coal area. About 300 acres or so were proved to carry coal. Evidently a basin or hollow in the old land surface favoured the growth of coal-making plants at that spot, and a thick bed of plant matter some 50 feet deep was formed. The shafts, three in number, struck the lower coal at 183 feet, 192 feet, and 130 feet, respectively. These shafts proved that the coal was 51 feet thick. But only the lowest six feet of coal was worked and sold. These East Rand coals run about 11 calorific when at their best, and the remainder of lower values has been in the past discarded and fresh coal fields sought.

New Mines Sought.

In this case the Clydesdale company moved first to the Free State coal district and afterwards, in 1914, to the Wit bank neighbourhood. To-day the principal colliery and revenue earner is the mine opened up on the farm Blaauwkrantz, Middelburg district. In all, counting a recent addition of ground taken over from an adjoining colliery, the property at Blaauwkrantz—now called Blackhills—is 1,000 acres in area. There a large mine has been developed and equipped to the half-million-tons-a-year stage. It is not worked at its maximum capacity, for no colliery need d that in South Africa, where the State railways fail to provide transport. But Blackhills is now producing about 30,000 tons a month. The total for 1918-19, the influenza and war year, was 203,990 tons. A net profit of £39.53 was earned by the company, out of which a dividend of ten per cent was paid on the capital, which stands at £185,000 all issued. The mine plant at Blackhills is of high excellence. The main headgear and machinery buildings, all of steel construction, were supplied by J. and R Niven & Co., and are of strongest design. In this mine the coal beds lie a little deeper than usual, as the coal measures in this neighbourhood are of almost record thickness for the Middelburg district. In a near-by property the total thickness is 450 feet; and in the Clydesdale the shaft is 300 feet deep. In consequence of this greater strain the headgears approach Rand gold mine dimensions. The main gear over the main shaft handles four large trucks per trip. There is also a powerful fan, and the screening, washing and picking and haulage plant is of the highest class.

Better Mining Methods.

Those interested in the coal deposits will find that in this mine there has been a departure from the rule " mine the thickest seams," now in force in most South African collieries. There are five seams, and the lowest, which is 5 feet thick, is worked. It is of higher quality than is common, and the company secures the benefit of this grade in its sale bills. There is still another evidence of good management. Mine plans have been worked out to allow the extraction of all the coal seams—a formidable task in its later stages. The lowest seam is 5 feet thick, the second is 4 feet 6 inches, the third or middle seam is 17 17 feet 6 inches, the fourth 20 feet, and the fifth or top seam, 6 feet 5 inches; in all 53 feet of coal. Large blocks of coal have been left about the two shafts and main hauling ways as a necessity for future operations on the higher seams. In the present workings about 40 per cent. of the coal is left as roof supports. The balance is practically clean saleable coal, for being hard and without shale bands it breaks with only a small percentage of fines. The manager, Mr. J. Boles, of Lancashire and Scotch antecedents, is a miner of much experience, and the satisfactory percentage of profits recorded is due mainly to the care and attention of Mr. Boles, and of his managing director, Mr M. Cullen.

A Fine List.

In an old company with such a history the financial statement is not so simple as usual. It was explained recently at the annual meeting of shareholders by Mr. Mackie Niven, the chairman. Among the assets are two working and equipped coal mines, and one gold mine—in suspended animation. There are two branch railways and sidings; the freehold of a coal-bearing area 7,551 acres in extent, and the coal rights, under lease, of 11,000 acres. There is a farm on which the livestock is valued at over £6,000, among the cattle being a number of pedigree animals. Shares in other

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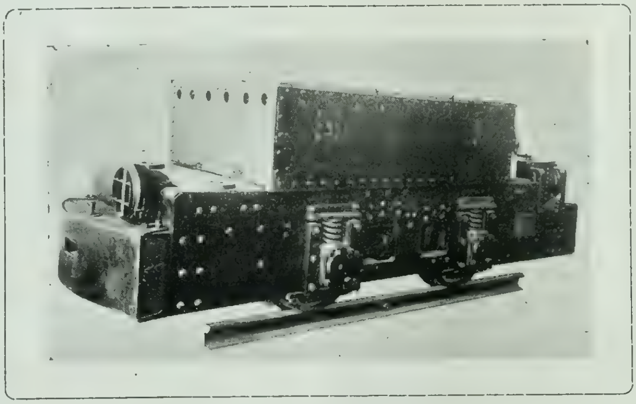

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companies (at cost) are put down as worth £15,781 6s. 3d. But the list includes 100,000 fully paid up vendor's shares of £1 each in the Cassel Clydesdale (Springs) Gold Mines, Ltd., and 50,000 subscribers' shares in the same company, on which 2s. a share has been paid. The cash in hand on 30th June, 1919 was £8,767 8s. 7d. As the chairman's summary set out, there was an increased profit in all the various sources of revenue—even the farming brought in a profit of £1,423 5s. 6d.

A FREE STATE MINE—ANOTHER CLYDESDALE.

We have mentioned that the first movement of this company in search of a new coal mine was to the Orange Free State coal field. The coal assets of a syndicate holding coal assets in the Free State about 13 miles south of the Transvaal border at Vereeniging, and a few miles from the main railway from the Rand to Bloemfontein were purchased. A farm Rietfontein, measuring 7,551 acres, was bought and the mineral rights on another farm measuring 10,188 acres acquired on lease. The colliery has been located on this leasehold farm, which in addition supports the name of Taaiboschspruit.

The Coal Bed.

First coal was proved by sinking a number of bore-holes, and these having given promising results, shafts were sunk. The coal beds have lost their shale and sandstone interleavings in that Free State field, and so far only one bed has been proved. And the thickening of the Karroo strata has put this coal bed deeper. Two shafts penetrated 437 feet before encountering coal, but on the other hand did not pass through it till 487 feet was marked. This result showed that the single coal seam was 32 feet 9 inches thick.

Above this coal bed a dolerite sheet 77 feet thick exists, and must be counted in any comparison of depth.

The Mine Equipment.

On this evidence an expensive plant was designed and put down. The steel headgear and building frames were supplied by the firm of J. & R. Niven, the winding engine by Messrs. Barclay & Co., and the electric lighting and power plant used on the mine by Messrs. R. H. Gould and Co. A good washing and screening plant was also erected; the whole outfit being designed to deal with 2,000 tons of coal per day.

The Value of the Property.

In the company's books this Free State property, known as Coalbrook, is valued at £139,987. This includes the original purchase price of the pioneer syndicate's assets, making approximately one-half of the debt, and the balance is accounted for by a branch railway line, buildings, shafts and mine plant.

Since putting out coal in 1905 the mine has been a steady producer, and up to the latest report accounted for 2,079,361 tons sold. It produces an excellent second quality coal, which is in demand especially for household use, as it is perhaps the best household coal on the market at present. Last year the Coalbrook profit was £18,039. The year before the result was a little better, but 1918 was a bad year for trucks and labourers, making the costs a few pence per ton higher and reducing the tonnage cut. The company's coal, it may be mentioned, finds its way in quantity to the south, as it is the most southerly situated of the northern collieries.

As regards the quantity it is estimated to be very great. All the area owned and acquired is underlain by this fine seam of coal, and the tonnage is practically inexhaustible by the present comparatively limited output.

Conclusion.

This outline of the Clydesdale Company's position is somewhat inadequate, but will suffice to show that it is a very sound and well-managed venture. Its controllers and directors are men of long experience, and, as the facts indicate, are abreast of the times. Mr. Mackie Niven, the chairman, must be congratulated on the merits of his long service, which to-day promises the shareholders a brighter future than any yet experienced. It is not every coal company that owns two large paying collieries and a gold mine in the Eastern Rand. The managing director as stated is Mr. Matthew Cullen, and the London and South African secretaries are the South African and General Investment and Trust Company, Ltd., whose offices in London are in Pinners Hall, Austin Friars, London, and in Johannesburg at Trust Buildings, Loveday Street

Engati Colliery (in foreground) and Buffalo Colliery (in background). View looking South-east along face of Mountain. For Letterpress see Natal Section. Native Compound, Buffalo Colliery in Distance.

MOUNT STEPHEN'S COAL FARMS.

A BIG TRANSVAAL PROPERTY.

South-east from the town of Middelburg, the district centre of the Northern Transvaal coal mines, there is a wide "bult" or swell of land whose elevation perhaps 300 or 400 feet above the town. A small stream is crossed just outside the town limits, and from this point there is a long and gentle ascent for several miles till the upper levels are reached on the farm Rockdale.

Four Coal Farms.

This is the first of four farms lying on this swell of higher ground. For some ten miles they continue on this higher level with a slight fall to the south-east, and sharper falls towards the north-east and south-west. The farms occupy in fact the higher ridge or bult, which is really an undenuded section of the coal strata that at one time covered the whole country.

These farms, Rockdale, Good Hope, Aronsfontein and Eikeboom are the property of a private syndicate which owns them in freehold. The areas are:—

	Acres.
Rockdale	3,158
Good Hope	3,722
Aronsfontein	6,257
Eikeboom	3,358
Total	16,495

They cover an area of about 26 square miles, and this area is to a larger extent occupied by the coal measures above the Dwyka. Owing to the small vertical depth of these measures, as explained in the section dealing with them, no mining difficulty will be experienced in locating the coal and in mining it. The depth of the main seam should be from a few feet up to 150 feet.

Level Beds.

A small mine has been opened up on Eikeboom, where a sharp fall of the ground to a depression of " pan " causes the coal beds to crop out on the surface. The values revealed by this small mine are entirely satisfactory. A seam, which is 12 or 14 feet thick, has been developed to a limited extent in order to ascertain the working conditions. The bed lies in strong sandstones and the roof will require no special supports. And the level floor makes mining easy. This feature, which is common over great areas of the coal fields, is a remarkable proof of the absence of great earth disturbances since the time when the coal was deposited in the Permian or later carboniferous period. We can see in these level coal beds the water levels of a time that was well back in the earliest phases of the earth's development. Practically every coal bed over hundreds of square miles is in the position in which it was laid down originally. Mechanical haulage systems can be operated over great distances underground, because gradients hardly exist. Naturally, small " rolls " occur.

The Coal Beds.

As stated, the development at the mine mentioned is small, but the drives are going in gradually towards the positions of a number of boreholes put down on Eikeboom. The results obtained from these holes are given in a report made by a competent engineer who analysed the results obtained on Aronsfontein and Eikeboom. One or two shafts were also put down.

He states: ' The coal seams which have been found on Eikeboom and Aronsfontein consist of alternate layers of bright dull coal. The section in the shaft is as follows:—

1 ft. 0 in.—inferior coal.
8 ft. 8 in.—steam coal.
1 ft. 6 in.—house and smithy coal.
2 ft. 10 in.—gas and coking coal.

Workmen's Cottages, Offices and Manager's House, Enyati Colliery. Front View looking East. Photos by van Heerden. Compare with Side View of same Colliery.

"I took," the report continues, "samples of the coal in large quantities and the bulk was repeatedly quartered down to smaller samples. The results obtained from this analysis were as follow:—

	I.	II.
	Per cent.	Per cent.
Fixed carbon	64·60	67·12
Volatiles	19·14	16·77
Sulphur	0·79	1·51
Ash white	7·41	20·90
Moisture at 110° C.	1·98	1·94

	III.	IV.
Fixed carbon	69·58	60·54
Volatiles	20·71	18·77
Sulphur	0·73	0·33
Ash white	7·41	20·90
Moisture	1·57	1·46

"The coke products from these four samples were respectively 78·09, 79·78, 76·99 (coking), and 81·44. Only No. III gave a caking result. The calorific values estimated by Thompson's calorimeter were, in the order given: 11·38, 12·42, 13·46, 13·09.

"The bright coal," he adds, "supplies a coal which is very suitable for coking purposes without any previous washing, as the amount of ash is far under 10 per cent."

STEAMING VALUES OF THE COAL.

While dealing with the quality of the coal we may quote first-hand evidence as to its value. The mine mentioned on Eikeboom has supplied coal to the Union Railways for test and other purposes. The distance, 13 miles, from the mine to the railway is too great for cheap handling, as the coal must be loaded on wagons and again offloaded on reaching the siding. The General Manager of the Railways, Sir Wm. Hoy, writing at the end of 1915, sends the report of the railway officer who carried out the tests, and who states:

"The sample from which the test was made consisted of good round coal of a bright and shiny appearance. It steamed freely, burning well down to the finger bars and leaving but a small quantity of fine soft ash, with which was intermixed small pieces of clinkers of such a size as to enable them to pass easily through the grates. The fire was not cleaned nor the grates shaken during the whole journey, and on arrival at Germiston was still thin and in a comparatively clean condition, and when dropped over the ashpit the residue was found to consist of a soft ash with small clinker fragments. The evaporative and ton-mile consumption figures were very satisfactory, and the coal should prove very serviceable for loco work if the present standard of quality were maintained."

The comment of the General Manager's Deputy is that "the efficiency of the coal on locomotives is approximately the same as the better class Natal coals and considerably above the usual run of coals from the Witbank district."

SOME PROSPECTING RESULTS

Prospecting operations have been limited almost entirely to Aronsfontein and Eikeboom. One borehole was put down on Good Hope. This prospecting was carried out in 1917 and 1918. Some earlier prospecting was done some years ago, in ignorance, apparently, of the fact that the coal measures occupy the higher levels, as those old bores were sunk on the north-eastern limits of the line of farms where the fall of ground already referred to would greatly affect the results. In these coal areas of the Transvaal a drop of a couple of hundred feet may mean that only the lower strata of coal will be cut, and thus, inadvertently, coal beds running into very larger quantities of coal may be missed Even the later series of holes put down on this property have not pierced the thickest portions of the coal strata which lie mainly, as would appear from a cursory inspection, on the farm Good Hope and portions of Rockdale. Certainly Good Hope should have received more attention, judging from its elevated position. As stated, however, the farm Aronsfontein has had most attention paid to it. A small shaft was even sunk on this farm and from this shaft 60 tons of coal taken out for the locomotive tests detailed above, as having been carried out and reported upon by the South African Railways. That test gave good results which were borne out by the borehole assays.

THE DEEPER BOREHOLES.

Of the nine boreholes sunk on Aronsfontein the deepest but one is No. 5, which was sunk 195 feet, and was stopped in what is labelled "Hard Red Sandstone." This may be the Waterberg formation, and if so, the Dwyka conglomerate is absent at this point, as the coal lies immediately on this "Red Sandstone." This core is therefore of interest as it may give a complete section of the coal measures on this part of Aronsfontein. The sequence of strata in this bore is sandstone and shale down to 79 feet. Then comes 4 feet of coal which is followed by more sandstone and shale down to 104 feet, when six feet of coal comes in. From this point down to 172 feet the strata are made up mainly of dark shales and some sandstone. Fourteen feet of coal was then cut, the bed lying as stated on the red sandstone, which was penetrated only 8 or 9 feet when boring was stopped.

Now bores number 6 and 7 of the respective depths of 192 feet and 186 feet, confirm broadly the section just given, showing two coal horizons. The lower zone carries 14 feet of coal in each borehole. The coal in the upper horizon is less persistent, for in one of these three holes "shaly sandstone" is reported at the depth where the Top seam should have been cut. One or two of the holes found only the lower seam of coal, being evidently outside the limits of the upper seam. On the other hand bore Nos. 1 and 2 cut two seams of coal, the thickness of the Top seam in No. 1 being 14 feet, and of the Bottom seam also 14 feet, while in bore No. 2 the Top seam is four feet six inches, with a black shale parting, and the Bottom seam, not counting a similar parting, is 21 feet 10 inches. In bore No. 3 the Bottom seam is again over 20 feet thick at a depth of 100 feet from the surface, while the Top seam is not reported.

THE THICKNESS OF COAL.

We give these details as they are of interest to coal miners who are just beginning to realise the vagaries of coal deposits in this Middelburg area. But the net result is to prove on Aronsfontein two distinct seams of coal, the bottom seam being naturally the most persistent, as the prospecting has been carried out at a level where the full tale of strata is not always present, denudation having removed the upper seams as it has done in the majority of collieries in this Witbank neighbourhood. But where the two horizons are fully represented the combined width of the seams is 26 or 28 feet of coal.

THE ABSENCE OF SULPHUR

A number of assays have been made of the coal produced by the drilling, and these present one feature of considerable interest.

Those accustomed to the analytic figures of South African coals will notice at once that the sulphur content of the coal in this area, as set out above, is much below the average. It is possible by using mixtures of coals, or by using binding material such as pitch to make coke of any coals. The real difficulty in coke making is to secure coals with less than one per cent. of sulphur. In this case therefore the evidence is that a coke which is almost free from

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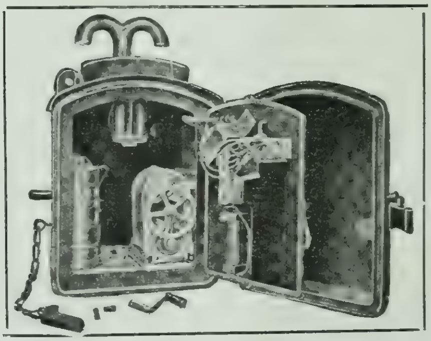

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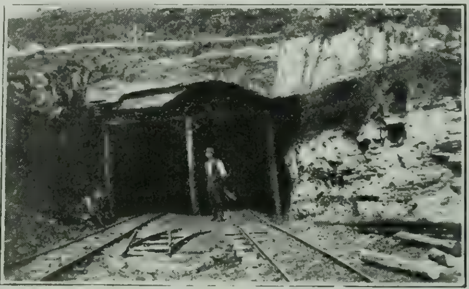
sulphur can be obtained in quantity. In the ironmaking industries in Europe the consumption of coke runs into millions of tons, and so far no large coal areas, low in sulphur, have been uncovered except in this property.

The "description" of the samples in the coal assays that have been made of these coals is not detailed enough to allow the low sulphur values to be traced. All that can be said is that it is in the lower section of the seam or seams. For example, an assay marked "41 inches top layer" returns 1.23 per cent. of sulphur, while the second and lowest layers of the same seam measuring five feet ten inches, return only .39 and .60 per cent. of sulphur respectively. Then the sulphur figures in the other assays run .72, .80, 1.53, .84, .44 and 1.52 of sulphur. The last result was obtained from an assay over the whole seam of 14 feet 3 inches—a very severe test as the ash content in this case ran up to 24.8 per cent.

While the evidence therefore is incomplete it points certainly to the existence of large areas of coal with a low sulphur content. Iron is now being sought for the needs of a smelting industry, and it is certainly encouraging to find that considerable sections of coal which are low in sulphur do exist in the Transvaal. So far as the writer is aware the only coal with less than one per cent. of sulphur per ton yet found is in a limited area in the Vryheid district of Natal. Some details will be found of the coking value of this Vryheid coal in the section dealing with by-products.

The Problem of Quantities.

As regards the probable quantities of coal in this block of farms we need not repeat the evidence on this subject detailed elsewhere concerning Transvaal coal beds. The main necessity on the part of the prospector is to prove the size and quality of his beds. In this case these desiderata have been kept in mind. The ash content is lower than usual, and the calorific value runs up in consequence to levels above the standards demanded at present. For the rest the area containing the coal is very extensive, running into thousands of acres, and indicating the probability that several hundred millions of tons of coal of varying qualities exist in this ground. But how much is high grade and how much is low grade, it is impossible to estimate. All that can be said is that the analysis and tests suggest that coals of special quality will be developed in this property.



Buffalo Colliery, Vryheid District. An Adit-Construction Period. For Letterpress see Mauritius Group, Natal Mines. Photos received too late for Insertion in Proper Section.

WAGES IN THE UNITED STATES.—A COMPARISON

The Iron Age, dealing with wages and living costs in America, states that for wage-rate comparisons three periods may be taken—the year 1899, when the iron and steel industry was experiencing a boom; the years 1913 to 1915, when wages were uniform after advances extending over a period of years, the last advance having been February 1, 1913; and the period from October 1, 1918, to the present time. These periods can be conveniently referred to as 1899, 1914, and the present, respectively. The hourly wage rate prevailing quite generally in the iron and steel industry of the Central West averaged about 12·2 cents in 1899 and 19·3 cents in 1914, while the present rate is 42 cents. The 42-cent rate was established on August 1, 1918, the subsequent advance of October 1 being by way of the establishment of the basic eight-hour day, with time and a half for hours in excess of eight. Thus while the present 42-cent rate, makes 42 cents an hour for eight-hour men, it makes 46·2 cents an hour for 10-hour men and 49 cents for 12-hour men. [Note.—A cent is equal to a halfpenny.]

For eight-hour men the present wages are 118 per cent. above those of 1914 and 244 per cent. above those of 1899. For 10-hour men the present wages are higher by 140 per cent. and 280 per cent. respectively. For 12-hour men they are 154 and 302 per cent. higher respectively. There is no room for argument that living costs, based on the same style of living, have increased by anything like as much as the percentages here computed. The shortest comparison represents more than a doubling for eight-hour men from 1914 to the present, while the longest comparison represents a quadrupling for 12-hour men from 1899 to the present time.

So much for comparison with living costs. For comparison with steel prices the basic commodity merchant steel bars may well be taken. Year by year, from 1899 to 1908 inclusive, ten times the hourly wage rate was a little less—roughly 10 per cent.—than the year's average price of steel bars per 100 lbs. Now the comparison is: 100 lbs. of steel bars, 2·35 dollars; ten times the rate paid eight-hour men, 4·20 dollars; ten times the rate paid 10-hour men, 4·62 dollars; ten times the rate paid 12-hour men, 4·90 dollars. The 12-hour men receive two and one-third as large a division of the selling price of steel bars as they did from 1899 to 1908.

GERMANY'S LATEST FAIR.

At the German National Industrial Fair, held in September at Leipzig, about 10,000 firms, mostly German, exhibited. There were some 7,000 foreign buyers present. The general impression was that nearly all branches of German industry were on the verge of a collapse, due principally to the shortage of coal, and also to the loss of export trade, and consequent inability to purchase much-needed foreign raw materials. The German manufacturer has concentrated on new mechanical devices and novelties, all shown at the Fair, with which he hopes to be able to gain access again to foreign markets. The majority of the German representatives seemed to be confident that they would be able to recover their export trade through American and neutral buyers; but as regards England, they felt that at present, at any rate, owing to the hostile feeling, they would be unable to make any headway in this country.

From the point of view of the German export, the most important exhibits were those of the Technical Section, including new types of machine tools, mechanical and electrical devices, and other novelties. In these branches the Germans were in a position to carry out orders quickly, and in many cases had considerable stocks on hand. The German mechanical engineering industry depends at the present juncture very largely on its foreign customers.

The prices of machine tools in general were from about 200 to 400 per cent. higher than the pre-war scale, and the representative of a large Saxon firm said they could deliver from stock anything from the largest to the smallest machine.

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WITBANK COLLIERY, LIMITED.

A BIG TRANSVAAL ENTERPRISE—PROPOSED INCREASE OF CAPITAL—THE MINES AND THEIR EQUIPMENT.

THE present capital of the Company is £210,000 in 210,000 shares of £1 each, all issued, fully paid. Directorate: Sir Evelyn Wallers, K.B.E. (Chairman), alternate C. Meintjes, M. Honnet, alternate A. J. Wright; Sir Abe Bailey, Bart. K.C.M.G., M.L.A., alternate W. J. Gau; C. S. Goldman, alternate R. Goldmann; J. Jeppe, alternate A. A. Barker; A. F. Mullins, alternate S. M. Nelson; P. Dreyfus, alternate W. H. B. Frank; and H. A. Rogers. London Committee: G. S. Fort, C.B.E., C. J. Parker and J. L. Siddall, alternate G. F. Rutt. Consulting Engineers: The Central Mining and Investment Corporation, Ltd. Manager at Mine: J. K. Addie. Business Manager: H. G. L. Panchaud. Secretaries: Rand Mines, Ltd. London Secretaries: A. Moir & Co. Solicitor: F. C. Dumat. Auditors: C. L. Andersson & Co., and F. W. Diamond & English. Head Office: The Corner House, Johannesburg. London Office: No. 1, London Wall Buildings, London E.C.

WITBANK COLLIERY—THE MAIN SHAFT.

The Witbank Colliery is producing from two main pits: the colliery situated to the south of the main plant and the Outspan mine. No coal is now being hoisted from underground, all the coal won being transported by mechanical haulage to the main plants where it is fed direct into railway trucks. The Witbank Company's workings now extend over a very large area of ground and the mechanical haulages are of great length. The coal seams on this property lie at a depth of about 90 feet, and the coal is hauled to the screening plants, which are of very simple design. The coal goes through jiggers and over conveyor belts, and the round coal is then fed straight into the railway trucks.

COAL CUTTERS.

In the Witbank Colliery the coal is cut by means of air-driven Siskol and Hardiax and Ingersoll coal cutters. Jackhamers are being used where hand-boring is inefficient. In the Outspan mine electrically-driven Sullivan Ironclad coal-cutting machines are employed. Jackhamer drills are also being employed. The capacity of the Witbank plant is about 2,200 tons per day, and that of the Outspan Colliery about 1,800 tons, but the output is of course limited by the truck capacity available on the railways and by the complement of native labourers available. The Witbank Company has recently resumed the production of tar, and taking advantage of the present high price of this by-product has installed a plant of 32 retorts, whilst a duplicate set is on the property awaiting installation. This equipment commenced work early in June, and although the company is at present producing tar, it is to-day primarily a testing plant designed to determine capacity and the grade of tar produced and the value of other by-products.

NATIVE LOCATION.

The native labour force of this colliery is well housed in a large native location consisting of a number of rondavels. The rondavels are well built and well thatched, and although not expensive in construction are most popular with the "boys," large numbers of whom are married and who prefer the privacy and domesticity of the rondavels to the compound system.

NEW EQUIPMENT.

Amongst recent additions to the plant of this Company may be mentioned a Sirocco fan, situated at a 12 ft. diameter air shaft in the southern section of the mine, and a new fine-coal bunker having a capacity of 1,000 tons which will be available for use in the near future.

Recent outputs have been as under:—

	Witbank	Outspan	Total
September	44,472	42,245	86,717
October	45,426	36,436	81,862
November	41,768	31,080	72,848
December	38,325	32,103	70,428

The main Witbank workings are being extended to the south and the width and grade of the seams is being maintained.

The Company is supplying the Johannesburg Municipality with gas coal from the Outspan mine.

FINANCES.

During the past year the Witbank Company paid out two dividends, each of 15 per cent., and the latest accounts show that the Company is in a very strong financial position, having net cash, after allowing for liabilities, of £50,031.

Representations have been made to the Board of the Company by certain large shareholders, with the object of increasing the capital of the Company from £210,000 to £350,000 by the creation of 140.000 shares of £1 each, and distributing such new shares to shareholders in the proportion of two new shares for every three shares held, as a bonus, thus capitalizing profits which have been reinvested in the undertaking in past years. The Directors, therefore, have decided to convene special general meetings of shareholders for the 28th January, 1920, and 19th February, 1920, for the purpose of considering a proposal to increase the captial of the Company as mentioned above.

ANOTHER VIEW OF THE WITBANK COLLIERY.

THE ZAMBESI COAL FIELD.

IMPORTANT DEVELOPMENTS FORESHADOWED.

A NEW coal area has recently come into prominence in the Zambesi Coal Fields. Although more than half a century ago Livingstone referred to the existence of coal in proximity to the Zambesi river, it is only quite recently that any serious effort has been made to exploit this area, which is in a favourable geographical position in relation to India and the East generally. The Zambesia Mining and Development Company, of which Sir Alfred Sharpe is chairman, has within the past year or two acquired concessions whereby this company owns the whole mineral rights until 1940 throughout the country, bounded by the Shire River on the east; the Anglo-Portuguese frontier on the east, north, west, and south; and the Luonya, Fize, and Zambesi Rivers on the south, an area which comprises roughly about 35,000 square miles. Within this area the existence of the great Zambesi coalfield, also gold, copper, iron, mica, and other minerals, is already known of.

The Imperial Institute sent out an expedition to these regions in 1913, and published a report in 1914, stating: "At a distance of about five miles from Tete the edge of the coal basin to the north is marked by the outcrop of a coarse pebbly stone. Its margin extends north-westerly and south-easterly, and it has been traced almost continuously to a point 170 miles to the western boundary of the Mozambique Co.'s territory. A great basin of coal-bearing rocks lies to the east and north-east of this line. The best outcrop of coal is seen on the right bank of the Moatize River, about three miles above the Revugwe Junction. Here for a distance of several chains a coal seam 20ft. thick is exposed, dipping at 15 deg. in a direction of 110 deg. between the beds of carbonaceous shaly mudstone. The coal is bright and lustrous, and, though somewhat finely jointed, appears to be of good quality, burning readily with a bright flame. It is clear that there is an extensive coal basin along the Zambesi valley."

Speaking at the meeting of the Zambesi Mining and Development Company, held in London the other day, the Chairman said: We feel that under the new conditions the demand for new coalfields, the coming construction of the Beira-Zambesi Railway, which will bring our nearest (easternmost) coal seams within some 20 miles of rail carriage, and the connection of the district with Beira, one of the best ports in South-East Africa, the time has come for sound, detailed investigation and exploitation. There are three main points to be considered: (1) Cheap transport; (2) the existence of accessible coal in large quantities; (3) the quality of the coal. The first of these will be solved by the construction of the Beira-Zambesi Railway, and probably eventually, a short branch line to the mines. The second essential is already proved. The third we are now taking steps to ascertain. This is, in fact, the one essential now waiting to be proved. We have decided that we must use the best methods, get the best men, and secure the best advice. It is no secret that the scientific use or treatment of coal is the subject of serious consideration both by H.M. Government and those interested in commercial enterprises in this country, and, in fact, throughout the world.

THE STEENKOOLSPRUIT COAL COMPANY.

LAND AND COAL.

It will be of service to readers if we give the particulars of one or two undeveloped Transvaal coal areas of some extent, and indicate the range of values that are dormant in the large coal districts of the country. And because the mines have been developed along the railway line eastwards through Witbank in a locality where they can conveniently reach the only markets yet developed, namely the mines and the ships, we shall limit ourselves to a couple of privately held areas of coal-bearing land in that area.

The Land Held.

A private company which has spent a good deal of preliminary money in boring, holds five farms extending south-east from the Tweefontein Colliery. Set out in detail these farms are:—Klipplaat No. 319, 2,112 morgen 264 square roods; Kromfontein No. 158, 2,792 morgen 593 square roods; Middel Drift No. 153, 1,252 morgen 136 square roods; Diepspruit No. 25, 902 morgen 568 square roods; Steenkoolspruit No. 304, 1,049 morgen 314 square roods; total, 8,110 morgen 75 square roods.

As a "morgen," Cape measure, exceeds two English acres in extent, we may put down the total area as 17,000 English acres—rather more than less. That is nearly equal to 27 square miles.

The whole of this large area is overlaid by the coal-bearing measures, that is the formation belonging to the lower Karroo. Sandstones and shales and coal beds lie, a thin covering of rocks over the far older strata. It is important to grasp this vital fact, because the larger portion of such areas of coal measures are in the Transvaal seamed by the coal beds. Small sections are cut out by "wash-outs" or coal may run in shaly coals, but as a rule where the lower Karroo formation exists in the Eastern Transvaal coal exists, oftentimes in considerable quantity. An examination by a competent engineer finds that these particular square miles are overlain by coal strata: that is the necessary fact that must precede any prospecting for coal. And in this case the investigation has been more complete and thorough than is commonly the case. Thirty-four bores have been put down through the coal beds, and the evidence of these investigators is that a very valuable area of coal seams exists in these farms.

Evidence of Boreholes

The block of farms as already mentioned is the neighbour in a south-easterly direction of the Tweefontein Colliery, of which we have already written. In a measure the values in the Tweefontein farm may be extended to its adjoining area, the farm Klipplaat, and the figures, making the needed changes for the developed life of the first-named would probably also apply to the last. The exploratory work, however, has been carried out to a great extent on the three farms Steenkoolspruit, Kromfontein and Middeldrift, which have been pricked with bores until a very fair estimate can be formed of the quantity and quality of the coal. One group of bores put down mostly on the three farms mentioned gave an average of 30 feet of coal seams. Another earlier test by boreholes, put down mainly on Kromfontein, gave an average of 20 feet of coal. The boreholes prove, however, that the condition of coal making varied, for sometimes the thicker seams of coal were in the upper beds and sometimes in the lower. Again the coals, judging from these numerous cross-sections, tend to run into coaly shales, and the shales to run into coal. But it is a general observation borne out by this evidence that nowhere in the area is the coal unworkable owing to shale laminations; always there is somewhere in the succession of strata a workable seam of coal, and in the great majority of cases the workable seams are too big for the somewhat primitive winning methods at present employed in the Transvaal coal fields, where thick beds are only partially worked. Let us take, for example, a borehole where the coal beds measure 29 feet, which is near the 30 foot average of the first group of 16 boreholes. The essential beds are 3 inches of coal at 69 feet; sandstone, 2 inches; coal, 3 feet 6 inches; sandstone, 3 inches; coal, 1 foot 2 inches; black shale, 1 foot 5 inches; coal, 10 feet. A little picking would make practically all of this series of laminations workable, but most local coal miners would take out, say, eight of the lower 10 foot seam of coal and let the rest stand, the argument, which is of course sound enough, being that the low prices obtained for the coal do not justify any picking out of fragments of shale and sandstone from the coal mined.

But let us go on. Below the series just mentioned there are 10 feet of sandstone, 4 feet of which is hard and quartzitic, then 1 foot of coal follows, and is succeeded by 42 feet of shaley sandstones and black carbonaceous shales. These are succeeded by 15 feet of coal, and below this coal the Dwyka conglomerate comes in below some inches of sandstone.

So far as thickness of the coal seams is concerned the section we have detailed is representative. But though there is a rough division into an upper and a lower coal horizon, this separation is not constant. In one or two cases the upper seams have disappeared owing to denudation, and in other cases where the coal seams run to thicknesses of 50 feet and more the two horizons tend to merge into a series of coal and shale seams.

The Quality of the Coal.

With these general facts before them, readers can form an appreciative idea of the thickness of the beds, and coal miners will appreciate the difficulties of mining these beds in any completeness. The second point as to the quality of the coal is quite satisfactory. The following analysis of the bottom seam on Steenkoolspruit is given as representative. The sample is marked "Bottom Seam No. 1 Borehole on Steenkoolspruit":

Moisture	2·15 per cent.
Volatile matter	30·85 per cent.
Fixed carbon	51·10 per cent.
Ash	15·90 per cent.
Sulphur	1·10 per cent.
Calorific power, Mahler bomb	12·35 per cent.

This analysis from No. 1 borehole, Steenkoolspruit farm, is not very different from that obtained from "No. 17 borehole," the last of the bores put down on Kromfontein. This result was:—

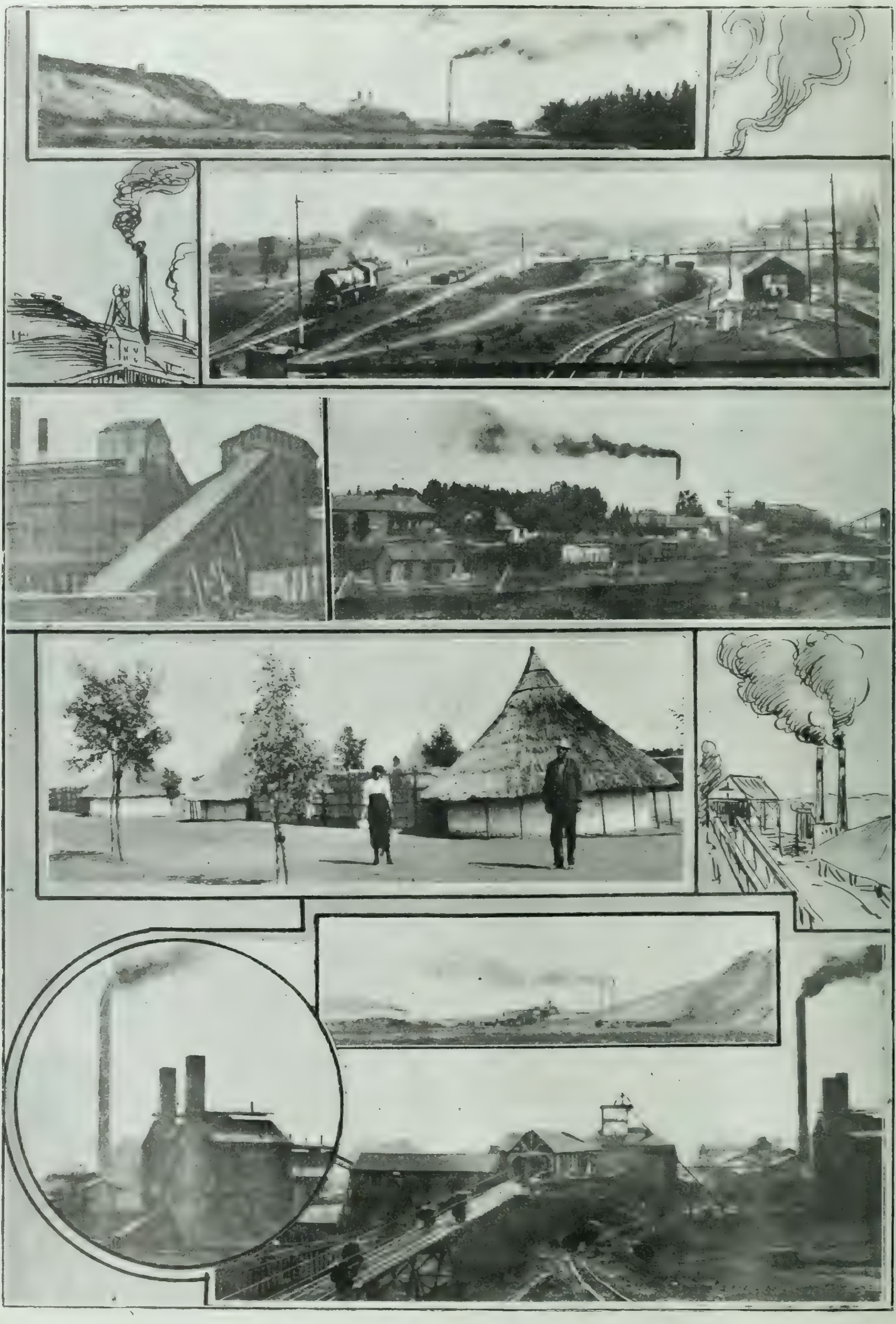
Moisture	2·80 per cent.
Volatile matter	24·40 per cent.
Fixed carbon	60·20 per cent.
Ash	12·60 per cent.
Sulphur	1·90 per cent.
Calorific power	12·55 per cent.

These values are about the average of the analyses made. In the eastern part of Kromfontein the ash percentage rises, and affects the calorific value, but on the other side this value rises in other parts of the area tested. In any case these analyses being taken from great thicknesses of coal cannot give the certainty that shafts would give. The main result is that over a great area the coal heating values are consistently high.

By-product Values.

And the indications of high values in the by-products are also good though not many analyses were made for by-products. Volatiles run to an average of not less than 25 per cent., thus indicating the gas values. The coke, where

TYPICAL VIEWS OF COLLIERIES IN THE WITBANK COAL AREA.



tested, is about 66 per cent., and the tar distillates from 15 to 26 gallons per ton. The nitrogen content is steady about 1·5 per cent. These are results that promise well for the value even of the lower grade coals.

SOME QUANTITY ESTIMATES.

Turning to the quantity indicated by the tests we have first the estimate of the engineer mentioned who reported upon the two farms Steenkoolspruit and Kromfontein. The area of the first is 2,223 English acres. It is estimated that two seams could be worked, and after deducting the allowances made for pillars and faults, etc., the estimate of the workable coal contained is:—

Top seam	18,315,000 tons.
Bottom seam	18,673,000 tons.
	36,988,000 tons.

Now according to the evidence of eight boreholes the average thickness of coal in the Steenkoolspruit area is 23 feet. It is not easy to estimate the quantity of workable coal over such thicknesses, and the estimate given is largely determined by the mental constitution of the engineer employed. But in any case this estimate must be taken as calculated on heat values, which are determined by the standard called for by the railways and mines—that is 12·5. Measured by this standard, the quantity mentioned is high; on the other hand, if second-grade qualities are included it is low.

On Kromfontein the same authority gives the following estimate of quantities:—

Bottom seam	47,498,000 tons.
Top seam	55,414,000 tons.
Total	102,913,000 tons.

In this case the area of the farm is 6,597 English acres, or three times that of the smaller farm just dealt with.

ESTIMATES OF LITTLE VALUE.

The difficulty of estimating quantities must again be borne in mind. In the conditions indicated by these exploratory tests the quantities taken out and sold or treated will depend upon the nature and extent of the efforts made, and plant erected to extract all the values now hidden in the coal. Companies, for example, are working and making profits out of the nitrogen content of South African coals—that is 2 per cent. of the quantity of coal treated. Now it may be that some of these beds of "inferior" coal, as measured from the heat value standard, may be "superior" coals when gauged for by-products, such as tars and chemicals or oils and nitrogen. The general evidence so far as it has been inquired into favours the conclusion that these Karroo coals are more valuable than the coals of Europe for any community which is technically equipped and able to extract their full values.

In the circumstances the figures given as to quantities are, in the present state of our knowledge, provisional. In this particular case we have given data upon which the theoretical quantities contained in such coal seams can be calculated. These quantities are far higher than those put forward as probable even if the coal is extracted merely for heating purposes; but how much higher only a more thorough development can show.

THE OTHER 8,000 ACRES.

The other three farms have not been dealt with. Boreholes have proved the existence of the coal seams on them, and they constitute about half the total area held. If exploration proves that this additional area is equally valuable, the inference is that this private company has secured a large area of coal of high quality and containing quantities to be measured in hundreds of millions of tons.

MORE COAL IN THE EAST.

According to the British Consul at Tamsui, the output of coal in Formosa in 1918 was 801,520 tons. "All other" represent more than half the total, but they included no fewer than 268 small mines, and in no case was the output in 1918 as much as 10,000 tons per annum. They are mostly mines that have sprung up in the course of the past 18 months, and owe their existence to the present high price of coal. Good quality coal at present costs about 19 yen per ton at Keelung. Exports of Formosan coal in 1918 were as follows: Hongkong, 186,473 tons; China, 88,682 tons; Philippine Islands, 6,801 tons; other countries, 130 tons; total, 282,086 tons. These were valued at yen 2,893,754—an increase of 29,000 tons and yen 1,108,895 as compared with 1917. This rise in price will be even more pronounced in 1919, as the exports for the first five months of this year amounted to 170,390 tons, valued at yen 2,543,856. Mining methods at most of the coal mines in Formosa are very primitive, and little machinery is used. Now, however, some of the large mines are getting deeper, more progressive measures may be adopted.

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SPAIN AND WORK.

A note from Spain says that the Spanish workmen are much upset by the War. The success of the Allies, the fall of many thrones, the penetration of democratic ideas, in brief, all upheavals in the social life brought about by the War have had their effect on the workers in the Peninsula. The effect produced by the Russian revolution, even on the most uncultured class of the population, was extraordinary. The Bolshevik propaganda could not fail to make an impression on the Anarchists, with which Barcelona and all other port towns were swarming. The extremists are now openly threatening to put an end to the *régime* of capitalists and masters, and the movement of the workmen is drifting more and more towards revolution, especially in Barcelona, where wages are the highest and the workpeople are living under the best conditions in the land.

ENGLAND'S NEW COALFIELD.

A commencement has been made with the building of a village of 500 houses close to the Chislet Colliery, one of the new Kent collieries, near Canterbury. The building of the village is an enterprise of the colliery company for the accommodation of their employees. Men in the building trade from the district have been engaged for the work, which is being hurried forward, as the colliery company will be increasing the number of their hands considerably within the next few weeks, when the No. 2 pit reaches the coal seam now being worked from the No. 1 pit.

The output at Tilmanstone Colliery one week recently was 3,252 tons, an increase of nearly 1,000 tons on the previous week.

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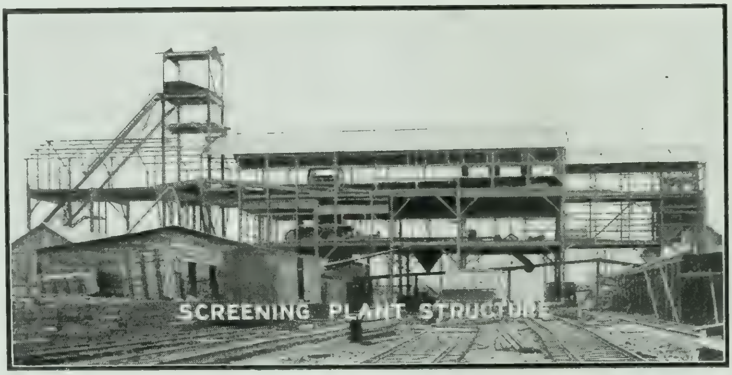

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THE USE OF ELECTRICITY.

ITS VALUE COMPARED WITH STEAM.

By A. E. du Pasquier, President of the S.A. Institute of Electrical Engineers.

Electricity has just as wide an application in coal getting as in any other field of utility. The same advantages of ease of transmission, flexibility, rotary motion instead of reciprocating, efficiency and low upkeep are just as important and necessary to economic coal production as to any other of the world's staple industries.

In Great Britain and on the Continent, after years of pioneer work, this is now fully recognised, and collieries are laid out from their inception for electrical operation. The shafts are sunk electrically, and in modern installations perhaps the only steam plant on the ground is a stand-by winder at the upcast shaft, and one steam driven compressor to provide a load for the boilers. Where coal winding is done in the upcast shaft, then a mixed pressure turbo set is often employed feeding into the main busbars, and the compressor would then be electrically driven either on the surface or perhaps preferably in bye.

The Elimination of "Sparking."

The only reason for using compressed air in the colliery is the possible presence of gas, and coal mining regulations which practically, at present, exclude electrical operations under certain working conditions. In the writer's opinion, such restrictions will all be removed in time, based as they are on the old days of continuous current machines with commutators that might and did spark and flash over, and when three phase squirrel cage motor or motors with enclosed slip rings were practically unknown. To-day with a completely earthed system with enclosed motors, iron clad switchgear and metallic sheathed cables properly protected against damage by falls, it is safe to take electricity into any part of a mine that a human being can work in, and impossible to say that his personal risk is increased by so doing; his personal comfort is certainly increased. Usually, when approaching this question with the colliery manager or engineer, one finds that the advantages of electrical operation are quite well appreciated, but the difficulty may be that the particular colliery is not within reach of a power supply company, and the output may not justify the putting down of their own generating plant to deal with all the load, including winding. Then all the old arguments come up, that steam is cheaper in first cost, that anybody can repair a steam engine, that the fuel which is being burnt has no market value, and, therefore, the admitted higher efficiency of electric operation ceases to become an important factor.

The Costliness of Steam

This fuel-of-no-value cry is a popular fallacy that takes a long time to kill. How often, when told this tale, does a visit to the boiler house reveal the "duff" indeed, but plentifully helped out with "large" to enable steam to be kept at all. It is really almost axiomatic that coal which will raise steam at all is always saleable, and coal which is not saleable should not be burnt under a boiler at all, but in a gas producer. To endeavour to burn it under a boiler may cost more than using the best large coal the colliery produces. Burning in a gas producer would [illegible] involve gas-driven generators and complete electrification.

The writer is prepared to admit that a colliery in this country has not at the moment an output of 40,000-50,000 tons a month, it may not be easy to justify complete electrical operation, including winding, unless served by a power company (adits are quite a different proposition and a much better case, even when the dip is comparatively steep), and the correct solution is to electrify everything else with or without a mixed pressure turbine set. The day will come when either through railway electrification or by local enterprise, our colliery districts here will have centralised power supplies, and every new undertaking should be laid out with this in view in order to reap as many of the economies as are reasonably possible from the start, and avoid the inevitable scrapping of plant that must take place with the scientific development of that particular district.

Our Collieries' Poor Equipment

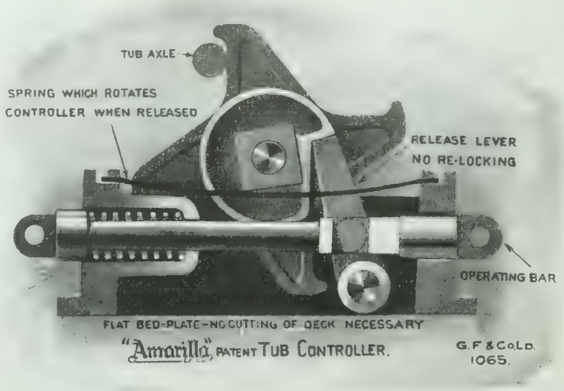
Yet, what do we see? Valuable virgin coal properties of proved quality with 40 to 50 years' life, opened up and run with second-hand plant bought from the reef; a second-hand winder here, a huge cumbersome compressor from there, a stack and boilers from a third place, regardless of economy, the old idea being used as justification that coal costs them nothing. First cost everything, economy nothing. Incidentally, by the time this second-hand plant gets erected on foundations, it is not quite as cheap as it looks.

It is a fact that the writer does not know of one modernly laid out colliery in the whole South African coalfield, and ironical to think that the very development of which we are so proud on the Reef has been largely responsible for the lack of development of our coalfields by reason of the *ignis fatuus* of the cheap plant rendered available by the conversion to modern ideas and up-to-date economies of the Witwatersrand. Cheap it is not, it is more like borrowing money from a usurer, easily come by, and thereafter a millstone round one's neck.

New Methods Wanted.

There is probably no country in the world to-day producing and selling coal at a lower figure than South Africa, or producing it more wastefully. But this cannot be a permanent condition. It means no imports of coal; it means a steadily increasing bunkering trade, and the growth of a real export trade. The price of our local coal in consequently bound to appreciate, and with increasing price increased economy in production becomes more and more important. Economy, efficiency, is the slogan of the age, one of the lessons the War has taught us. It is conceivable that a day will come when to burn coal as we do now will not only be considered wanton waste, but may be legislated against except in super-power stations in which the maximum possible thermal efficiency can be obtained, and even there only after many of the valuable bye-products have been recovered by distillation.

That is not quite in sight to-day, is only dimly on the horizon, but an horizon advancing on us at a not-to-be-calculated rate. Already the rate is so great that modern machinery no longer wears out, but is discarded through obsolescence. Obsolescence of machinery is as inevitable as old age, and it becomes doubly necessary to instal initially plant and machinery which represent the acme of development to-day.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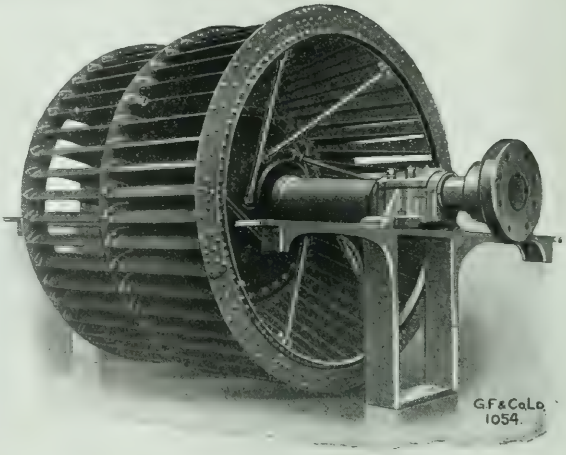

"AMARILLA" MINE FAN.

MACHINERY OF THE NATAL COAL FIELDS.

Wanted: a Central Power Project.

COAL CUTTERS, FANS, HAULAGE AND HOISTING MACHINERY, PUMPS, PICKING, SCREENING AND WASHING PLANTS BRIEFLY DISCUSSED.—A MARKET OF EXPANDING TENDENCY.

The general impression left on a visitor to the coalfields of Natal is that the equipment of these collieries, although, of course, suffering by comparison with the modern and gigantic scale of equipments on the Rand, is quite comparable with the plant of the larger Transvaal coal pits, and that it is adequate to maintain the present output capacities of the various component units of the Natal coal industry. On the other hand it seems clear that if there is any very substantial increase in Natal's export and bunkering trades, such as is to be expected, when the railways are in a position to haul very much larger tonnages to the coast, there will have to be some augmentation of existing equipments, particularly in regard to coal cutting machinery, haulage, and hoisting gears, and screening, picking and washing plants. But perhaps the outstanding impression of all is the absence of any co-operative power plant scheme which would serve the various coal mines, such as that in vogue in the Transvaal.

The Natal collieries, although not so compactly situated as the Witwatersrand gold mines, are eminently suited to central power projects. The coalfields of Natal may be divided into two areas, firstly, the old collieries of Klip River county, Northern Natal, and the newer areas around Vryheid. One large power station situated in the centre of either of these areas could well serve the various somewhat scattered pits, or otherwise, two stations, one central to the older collieries, situated along the main line, and the other central to Vryheid, might be installed. In either alternative there would appear to be excellent recommendations for the establishment of such station or stations. Large quantities of fines and low grade coal which do not at present command a market, and are for the greater part wasted, would be available for consumption in the power plant, which should not only prove a profitable concern in itself, but would also conduce towards more economical and efficient working of the coal mines contributory to the scheme.

Although there is no such scheme in existence to-day, it is reasonable to assume that with the promised development of Natal's coalfields, the building up of a by-product industry and the electrification of the railway from Glencoe to the coast the merits of a central electrical power project will become more attractive and more obvious.

Steam, electricity and compressed air are all utilised on the Natal coal areas. Hoists, pumps, picking, screening and washing plants are steam-operated; compressed air is utilised for the operation of various types of coal-cutting and coal channeling appliances. Electricity has its limitations according to the gaseous or non gaseous nature of the collieries, but electically operated coal cutting machines are in great favour in the Vryheid district, where the mines are not firey, and also at some of the older "main line" Natal collieries, where conditions admit of the employment of electrically operated machines underground. In this connection it is of interest to note that the Newcastle Collieries Co. has recently installed four electric machines, and that electric coal cutters are also employed in the Elandslaagte Co.'s mines. Sullivan, Hardyax and Siskol machines are all extensively employed, and rock drills of gold mine type are also being used in one or two pits.

Of recent years there has been no great influx of mining machinery into the Natal coalfields. Development has not warranted extensive purchases, particularly during the period of high machinery prices caused by the Great War. Natal collieries have, however, been good buyers of the best class of second-hand machinery on the South African market, and have acquired extensive equipment from defunct collieries. The progressive Durban Navigation Company at Dannhauser has, for instance, been liberally equipped with machinery acquired from the old [illegible] Colliery Company, and no one who has visited the Durban Navigation property can fail to be impressed by the efficient and business-like manner in which this property has been laid out and equipped.

In the near future there is a strong probability of an extensive broadening of the Natal coal mining machinery market. Several of the older collieries are opening up new pits, and two or three new endless rope haulage plants are likely to be required very shortly. The market for coal-cutting appliances will also expand, and as the workings become more extensive there will be further need of ventilating appliances. Several excellent fan installations have been giving good results in the Natal coal mines for some years past. Brief descriptions of these are to be found under the headings of individual collieries elsewhere in this number. Weddell, Capell and Sirocco installations are employed, and in connection with the latter it will be of interest to note that the Durban Navigation Company has recently placed an order for a Sirocco fan of 500,000 cubic feet of air per minute capacity. This will be one of the largest fans at work anywhere in South Africa.

THE DIVIDEND ASPECT OF NATAL COAL.

SMALL PROFITS TO DATE.—BETTER OUTLOOK FOR THE FUTURE.

Although most of the Natal collieries are paying out dividends, it should be realised that the distributions are not very large, and that the amount of money won in profit on the basis of each ton of coal produced has so far been insignificant. In our view, a far greater measure of prosperity will come the way of the Natal coalfields in the near future when the truck shortage difficulty is partially remedied and provided that closer co-operation amongst colliery owners can be obtained. The fact remains, however, that up to date the Natal collieries have by no means been prolific dividend payers. In this respect the following table of dividends paid by Natal coal companies since 1905 should prove of interest:—

Year.	Total Coal Output for the Colony. Tons.	Total Dividends paid. £	Dividends paid (per ton).
1906	1,238,713	50,300	9.7d.
1907	1,530,043	69,425	10.9d.
1908	1,668,743	79,287	11.4d.
1909	1,786,610	62,087	8.3d.
1910	2,296,687	54,489	5.7d.
1911	2,391,238	51,100	5.1d.
1912	2,472,085	71,685	6.96d.
1913	2,608,408	67,700	6.2d.*
1914	2,318,241	91,847	9.5d.
1915	2,071,371	44,956	5.2d.
1916	2,757,678	97,632	8.5d.
1917	2,578,918	127,801	11.9d.†
1918	2,330,000	161,043	1/4

* Natal Associated Collieries formed from January, 1913.

† Includes £15,271, 10 per cent. bonus paid by N.A.C. on account of sale of S.S. Battenhall.

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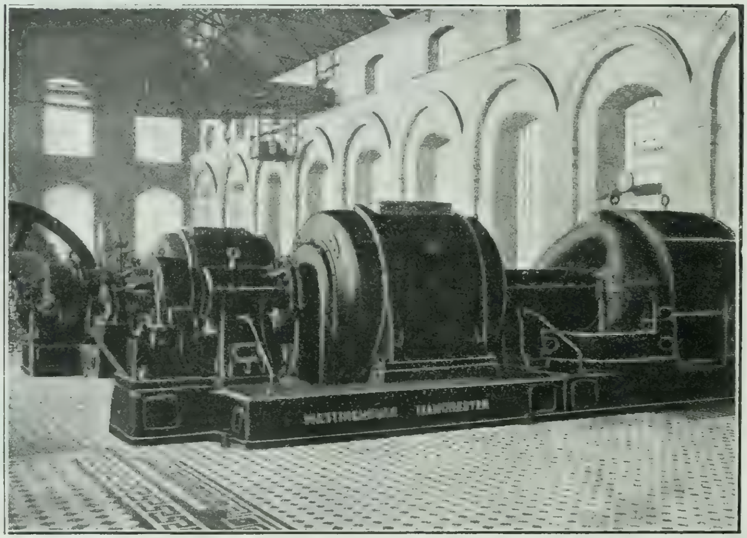

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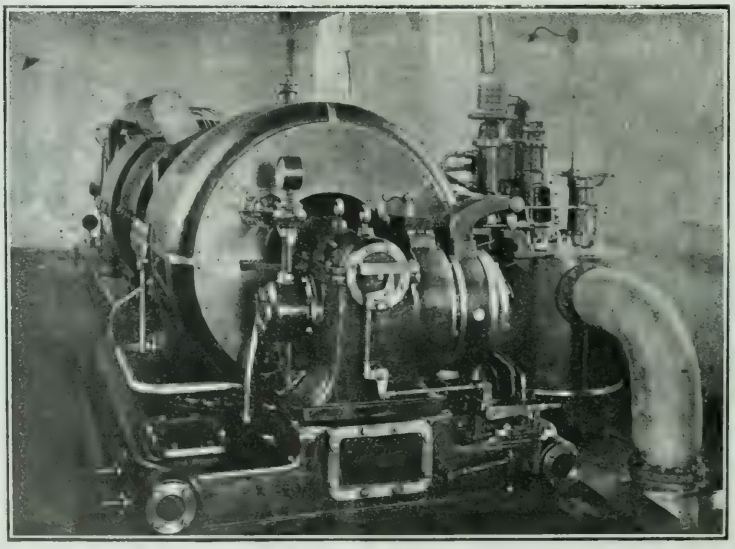

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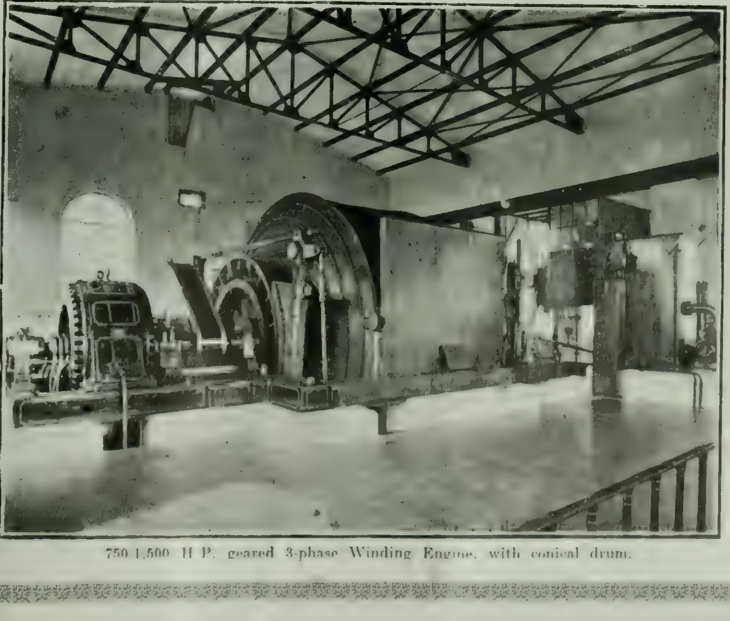

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COAL CUTTING MACHINES.

THE ERA OF LABOUR-SAVING APPLIANCES—SOME FACTS AND FIGURES ABOUT REPRESENTATIVE COAL CUTTERS.

Although there has been no progressive development and improvement of coal mining machinery in South Africa which is comparable with the vast progress made by the gold mining industry in regard to equipment, South African collieries have slowly but surely developed a tendency to introduce improved mechanical and electrical methods of winning coal.

The coal operator is interested to-day as never before in the history of the coal mining industry in maintaining a maximum output at a minimum cost. He is confronted with a large demand for coal on one hand and with labour and truck shortage and high cost of explosives and supplies on the other. Hence he turns to the consideration of machine mining with unusual incentive to attempt the solution of these problems. It will therefore be of interest to give a few particulars of types of coal cutters which have proved themselves efficient and economical machines.

The No. 47 Canadian Ingersoll-Rand Radialaxe is a representative type of coal mining machine, by the use of which the coal operator can solve the labour problem in many mines, the explosives cost can be reduced to a mere fraction of those involved in blasting off the solid, and in addition the usual amount of fines can be greatly decreased.

The Radialaxe is not a new type of machine. Hundreds of them have been installed in coal mines in many districts and have established favourable records for mining efficiency, ease and low cost of operation.

Like all so-called " post coal cutters," the Canadian Ingersoll Radialaxe No. 47 makes its best showing under mining conditions unfavourable to other types of machines, viz., in coal seams whose pitch is from 15 to 55 degrees from horizontal. Its successful operation in some coal seams practically flat or of but small slope, has clearly proven that its field of usefulness is by no means limited to sloping seams. Thus although the " Radialaxe " was originally designed for special service under certain limitations of mining, years of practical experience with it have constantly widened its field of usefulness.

Mounted upon its vertical column centrally placed at the coal face, this machine is good for cutting, at one set up, a room whose maximum width may reach 25 ft., and whose depth of coal undercut may reach a maximum of 9 ft. In ordinary mining operations the width of room cut averages about 16 to 20 ft., while the depth of undercut averages 5 to 6 ft. at one set up. The vertical height of undercut is about 6½ inches at the face and 5 inches at a depth of 6 ft.

When mounted on a horizontal arm clamped to the vertical column, the " Radialaxe " is extensively used for centrally shearing a vertical cut in the coal face. In some mines where the seams are narrow, and highly sloping, and particularly if the coal is " tight," the machine is used for shearing almost entirely. In many mines the " Radialaxe " is used for both undercutting and shearing, but in most of them its use is largely confined to undercutting.

While this machine was designed for coal cutting, its rugged construction also allows its use as a rock drill for trimming or " brushing " down entry rock walls and taking off the rock on either side of the coal seam. This double use of the " Radialaxe " makes it particularly popular in somewhat narrow seams where the entries are continually requiring the taking up of rock bottom or " brushing " down the rock roof.

The height of the undercut above the level of the rock floor is, of course, readily adjustable. This allows the machine to be splendidly adapted to another use which improves the grade of coal product carried to the surface. In many mines the coal seam carries a more or less regular dirt band or seam containing most of the " sulphur balls." Where the thickness of such seam is not too great, these bands of impurities are readily removed by the "Radialaxe." Such bands having a maximum thickness of 8 to 10 inches have been profitably removed in many mines. The machine undercuts the lower 5 to 6 inches of the band, after which the rest of the dirt either falls of its own weight or is barred down with a small amount of labour.

In consideration of the many speed performance records made by this machine at many different mines, it is noted that the following are the main items vitally affecting the speed of undercutting:—

1. Hardness of coal and amount of its impurities.
2. Mining conditions such as " tightness " of the coal and condition of floor and roof.
3. Width of room or entry cut by the machine.
4. Air pressure available.
5. Terms of labour payment—whether by day wages or by contract payment of so much per ton.

Method of " Radialaxe " Operation.—In the undercutting operation of the machine it is set up on its column centrally placed in the room and some 3½ or 4 feet from the coal face. The column is usually set up with its screw end next the roof, in order to allow plenty of room for manipulating the screw and permit working the " Radialaxe " as close as possible to the bottom of the coal seam.

By means of the worm crank, the " Radialaxe " is swung back and forth as it cuts a groove about 2 inches deep on each swing. With the bit at the extremity of its swing, the feed screw is advanced two or three turns and the bit swung back. When the limit of the feed is reached, an etxension steel, 21 inches longer than the first, is inserted and the process repeated until the desired depth of undercut in the centre of the room is reached. At the extremities of this arc of undercut, the corners are now worked back square to this same depth, thereby completing the undercut.

Shearing.—For shearing with the " Radialaxe " the column is mounted about 10 inches from the line of shear desired. The safety clamp is then mounted on the column in such a position as will bring the centre line of the " Radialaxe " cutter about opposite the middle of the coal seam.

Rock Drilling Work.—When used as a regular rock drill, the " Radialaxe " is mounted as usual, but the swinging mechanism is not operated, so that the drill always strikes in the same place. When used in rock work, a rock drill steel is substituted for the usual coal bit, the steel, of course, requiring a taper shank to fit the standard chuck.

Variation of " Radialaxe " Work with Air Pressure.—Like all compressed air machines, the amount of undercutting performed by the " Radialaxe " depends upon the available air pressure. The air consumption also varies widely with the pressure, being considerably greater at 90 lbs. than it is at 60 lbs. The question of securing the greatest possible amount of work from the machine at the least expense for air has been solved by careful tests. These have determined that the machine works most economically at 75 lbs. air pressure. Higher pressures give greater undercutting speed, but the air consumption increases faster than the corresponding amount of work secured.

Sharpening Coal Cutter Bits.—The many advantages of properly formed and sharpened coal cutter bits, resulting in the increased efficiency of the coal cutter, are now so universally recognised that a great many coal operators are installing bit sharpening machines of the Leyner-Ingersoll type. Hand sharpening is, at best, expensive and unsatisfactory. It is evident that the problem of maintaining a supply of properly sharpened bits at the minimum cost resolves itself into one of installing machine sharpeners.

While rapidity of sharpening is a valuable feature, it is secondary to the capability of a machine sharpener to produce perfect bits, having correctly formed cutting edges with sharp corners, and correct gauging so that successive sets of bits will follow without binding.

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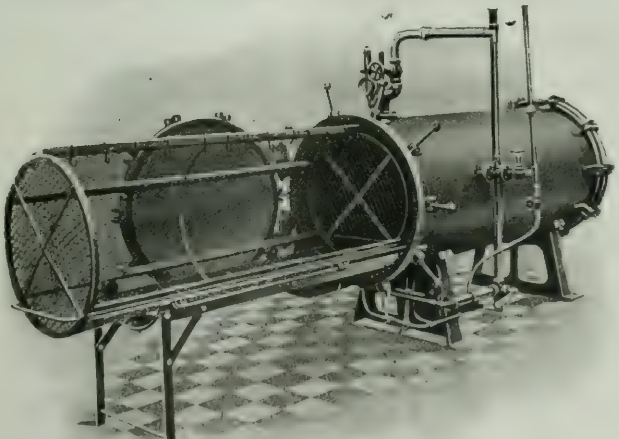

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control, the absence of usual vibration, the simple die and dolly method of sharpening, and general conditions of comfort for the operator, all tend to promote his efficiency and expertness.

The range of work performed by the machine sharpener is not limited to sharpening bits of practically any size and shape, but will make perfectly formed tapered shanks on the bits so that they enter the bit holder without any trouble or waste of time in extracting them. In addition the Leyner sharpener is adapted, by the addition of devices, to many other classes of work, such as making pipe hangers, pins and spikes, bolt and rivet heads and various kinds of bending, forming and forging. In short, a machine sharpener soon pays for itself in any colliery.

THE "SISKOL" COAL-CUTTER.

In dealing with the coal industry of the Union it is not out of place to mention a machine which has played quite an important part in the development of that industry during the last ten years—we refer to the "Siskol" coal-cutter. This machine was introduced to the British collieries some 18 years ago and was a distinct innovation in mechanical coal mining.

A light, portable, practical coal-cutter filled a long-felt want, and from a very small beginning the merits of this machine have commended themselves to colliery men all over the world, and to-day the "Siskol" is to be found in practically every coal-field.

During the War the tremendous demand for coal led to a much greater adoption of mechanical coal-mining and the makers of this machine were hard pressed to cope with this demand. Their works in Sheffield have been entirely remodelled and enlarged and further extensions are still in progress.

Arising out of the Sankey report and the altered conditions in the collieries of Great Britain, a new interest is being taken in labour-saving devices, and many pits which for generations have mined their coal entirely by hand are now installing "Siskol" coal-cutters in large numbers.

This machine has found particular favour in South Africa, where it is so well known that a detailed description is unnecessary. It made its first appearance in this market fifteen years ago, and is now extensively employed by the majority of the collieries in the Union. It is readily handled by the mine natives, and the makers with their long experience of underground conditions build a machine that is "Kaffir-proof."

The success of the "Siskol" has been so marked and the machine was such a departure from current practice at the time it was introduced that it is only to be expected that other machines of similar design would be produced. Such has been the case, and quite a number of firms have shown their appreciation of the peculiar merits of the "Siskol" by producing machines which followed as nearly as possible the lines laid down by the original machine. It is not within the scope of this article to draw comparisons, but as such machines come and go while the "Siskol" continues steadily on its way, it can only be assumed that the lead which this machine has maintained from the beginning will not readily be wrested from it.

The fact is that underground conditions impose such a rigorous test that none but the very best can hope to survive for any length of time. The "Siskol" was first, and that it still readily holds its own after years of competition proves that its makers are well up in their particular business.

The tremendous possibilities of the coal industry of South Africa are set forth at length in other parts of this special issue, and there can be no doubt that mechanical coal-mining will be still further introduced and extended. The makers of the "Siskol" are prepared for the big increase which is likely to result in this business and their plans have been maturing for some time past. They have already a well-equipped workshop in Johannesburg, where special repairs, such as re-boring of cylinders, etc., are undertaken, and a regular repair service has been part of their programme for many years past.

The future of the coal trade of this country is assured, and the "Siskol" coal-cutter, which the man-in-the-street has probably never heard of, but which has played no small part in the development of the coal resources of this country, will unquestionably play a bigger part in the immense possibilities of the immediate future

THE MINING MACHINERY MARKET AND THE COLLIERIES.

RECENT PURCHASES—AN INTERESTING ANALYSIS.

In order to give our readers some idea of the volume and value of the South African mining machinery and stores markets in so far as they are concerned with collieries, the following facts and figures abstracted from the annual reports of the Department of Mines and Industries of the Union of South Africa should prove of considerable interest. The figures refer to the year 1918, the latest period for which detailed statistics are available. The largest items in the table of "stores consumed" were, in respect of machinery as follows:—

	Transvaal.	Natal.	O.F.S.
Machinery and machine tools...	£24,430	£37,601	£4,140
Pipes and pipe fittings	£18,887	£16,209	£975
Rails, crossings, sleepers, etc.	£19,517	£17,799	£1,061

Purchases of coal-cutters and machine spares for coal-cutters were:—

	Transvaal.	Natal.	O.F.S.
Coal-cutting machines—number..	88	20	6
Value	£6,372	£2,394	£720
Coal-cutting machine spares......	£9,386	£4,506	£415

Lubricants (oils, greases and tallows) constituted an important market. Purchases for the three coal mining Provinces were as follows:—

	Transvaal.	Natal.	O.F.S.
Lubricants—Oils, gallons	80,337	80,645	11,751
Value	£16,251	£14,203	£2,216
Grease and tallows	£5,964	£6,810	£1,206

A more detailed statement of machinery and machine tools is called for, and under this heading the following are the principal items:—

	Transvaal.	Natal.	O.F.S.
Boiler plant other than that of locomotives, traction engines or steam wagons	£4,693	£5,181	£89
Headgears	–	1,123	– –
Steam engines—			
(a) For winding	—	1,713	—
(b) For pumping	372	1,202	—
(c) For compressors	4,599	1,100	—
(d) For generating electricity	200	3,342	—
(e) For other purposes	507	710	--
Pumps—			
(a) Air-driven	296	2,333	—
(b) Driven indirectly by steam	1,836	1,611	18
(c) Driven indirectly by electric motors	1,172	610	—
Belt conveyors and elevators ...	1,113	190	313
Other mechanical haulage	813	3,713	-
Treatment plant, including furnaces	—	5,500	—
Workshops plant	765	2,599	—
Mine ventilation plant	1,060	171	—
Miscellaneous machinery	4,253	6,455	634

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ELECTRICAL MACHINERY ON THE COLLIERIES

Purchases of electrical machinery during 1918 were as follows:—

	Transvaal.	O.F.S	Natal.
Electric generators and engines driving same if directly driven	£2,656	£895	£2,334
Electric hoists, including motors...	177		
Electric motors driving pumps, including pumps if directly driven	662		796
Electric motors not included above	658	230	1,440
Power lines, transformers, etc......	1,420	1,003	768
Electric bells, telephones, and other fixtures	699	26	1,361
Miscellaneous machinery not particularised above	581	152	509

In connection with these figures it should be remembered that the high cost of machinery and commodities during the War period and the great difficulty experienced in obtaining delivery of equipment manufactured overseas tended towards economy in consumption of stores and induced several mines to postpone purchase of plant of which they were in need. Now that the War is over and more shipping space is available, an increase in the volume of the coal mining machinery market in South Africa is to be anticipated as scon as conditions approaching to the normal obtain.

During the War period there was a considerable dearth of pumps in the Natal coal fields. Natal mine water is very acid, and this fact, coupled with the tremendous floods experienced in 1917, put a greater strain on the colliery pumping plants than they were capable of bearing. More pumps are still required in certain of the collieries, and the demand for machinery of this type is considerable.

TYPES OF COKE-OVEN PLANTS.

THE SEMET-SOLVAY INSTALLATION AT NORMANBY PARK STEELWORKS.

This plant forms part of an equipment of an iron and steel works, *viz.*: the new works of Messrs. John Lysaght, Ltd., at Normanby Park, Lincolnshire. The installation comprises a large coal washery ninety-six regenerative coke ovens of the Semet-Solvay type, yielding 3,000 tons of coke per week from a mixture of South Yorkshire and other coals; and complete plant for the recovery of tar, ammonia and benzol. The power for running the plant is derived from gas engines, operating on blast-furnace gas, and the surplus gas from the coke ovens is allocated for use in the steel works. The ovens are in two independent batteries.

The coal washery, designed and erected to the special requirements of the owners, has a capacity of 100 tons per hour.

Each of the ninety-six Semet-Solvay regenerative ovens carbonises 50 tons of washed coal per week. The stamped slack is served into the ovens by charging machines, no top charging arrangements being provided. There are two chargers and two coke-ramming machines, each having independent motors for the several motions. The coke is pushed out through Darby quenchers on to an inclined coke hearth, over which it passes on to 36 inch tray-conveyors delivering inwards to a central screening station, and thence to the blast furnace skips or wagons.

The gases are collected in a main into which each oven is coupled by means of an adjustable dip-pipe sealed in the liquor and tar collected in the main. The inlet valves and the main itself are washed and kept clean by strong sprays of weak liquor. The gases are exhausted through a series of air and water condensers by Bryan-Donkin machines driven by variable speed motors through double helical gear, enclosed in cast-iron oil casings.

After leaving the exhausters the gases are passed through tar extractors and through a series of Holmes' rotary scrubber washers (motor driven) for absorption of the benzol and remaining ammonia, and then through suitable governors, one-half to the ovens for heating the flues, and one-half to the steel works. Part of the surplus gas is devoted to raising steam for distillation purposes, in a battery of double flue Lancashire boilers.

The finished tar is delivered into a storage tank of 300 tons capacity, and the ammonia liquor as required to be distilled in the sulphate house. The interior of this house is shown in Fig. 4. It embraces three complete and independent units—a unit consisting of heater, still, liming apparatus and saturator—any two of which can deal with the whole make. The free ammonia is driven off in the upper part of the stills, from which the liquor is led into a vessel where lime additions are made (the vessel having a conical bottom for sludging purposes) and is thence led back into the lower part of the still. The saturators are of the self-discharging type, placed at such a height as to deliver the salt by gravity over draining tables to centrifugal driers and thence by conveyors to stores. The driers, conveyors, pumps, etc., are all driven by motors, and the house is spanned by a travelling crane.

The benzolised oil is delivered to the light oil or crude benzol house and treated in a Solvay still, with the usual complement of condensers, separators and pumps. The latter are driven by line shafting from a motor outside of the main muilding. The crude benzol is stored in a 100-ton tank, and the debenzolised oil cooled and returned into circulation.

The quenching and cooling water is handled by a group of direct-coupled centrifugal pumps shown in Fig. 6, housed in a building which contains also the main distribution switchboard. The water is stored in concrete tanks built on top of the washery building. The plant is equipped with motors supplied by the British Yestinghouse Co., Ltd., and it was designed and erected by the Coke Oven Construction Co., Ltd. (Semet-Solvay System), Howard Chambers, Sheffield.

ELECTRIC LIGHT COST.

A correspondent, "E. C. S.," writing to "Engienering" from South Australia, supports certain data he put forward concerning the cost of electric light. He gives the figures published by the late Professor John Tyndall, in 1880, and more recenly expanded by Professor V. B. Lewis, viz.:—

Per cent. Energy transformed into Heat and Light.

	Heat. Per cent.	Light. Per cent.
Candles	98	2
Oil lamps	98	2
Coal gas		
Flat flame and Argand	98	2
Regenerative	93	6
Incandescent	88	12
Electric		
Geisler tubes	97	3
Incandescent	95	5
Arc	90	10
Magnesium light	85	15
Sun light	70	30
Glow worm, fire flies, beetles	1	99

H. A. Earle also writes: "From investigations which have been made in connection with the energy consumed by incandescent lamps, we find that of the total heat units in the coal practically the whole is dissipated and only a remainder of ½ per cent. is converted into the light which it has been our object to produce."

My query was whether such an exceedingly wasteful process as the production of electric "light" from the increasingly scarce commodity coal can be justified? The distribution of electric power is highly efficient, the delivery of power by gas means taking first place.

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ASSOCIATED BRITISH MACHINE TOOL MAKERS.

ASSOCIATED BRITISH MACHINE TOOL MAKERS.

The Associated British Machine Tool Makers, Ltd., for whom Henry S. Potter, Ltd., 26, Cullinan Building, Johannesburg, are the representatives for the Union of South Africa, Rhodesia, Katanga and Mozambique, have issued an attractive catalogue.

British machine tool makers have long recognised the fact that the immense variety of types of machines made by the different firms was not conducive to speedy and economical production, prompt delivery, improvement in design, or accurate manufacture, and that if much of the undesirable overlapping could be eliminated, and standard machines manufactured in large numbers, the British trade would be better enabled to meet the competition of foreign makers.

Despite the great disadvantage of multiplicity of designs under which individual firms laboured, no vigorous efforts were made to remove this serious obstacle until the company known as The Associated British Machine Tool Makers, Ltd., with its Head Office at 34, Victoria Street, London, S.W.1, was formed by the following well-known firms:—James Archdale & Co., Ltd., Brimingham; William Asquith, Ltd., Halifax; J. Butler & Co., Halifax; Churchill Machine Tool Co., Ltd., Manchester; Kendall & Gent, Ltd., Manchester; John Lang & Son., Ltd., Johnstone, near Glasgow; J. Parkinson & Son, Shipley; Geo. Richards & Co., Ltd., Broadheath, near Manchester; Thomas Shanks & Co., Johnstone, near Glasgow; Smith & Coventry, Ltd., Manchester; H. W. Ward & Co., Ltd., Birmingham. Although several of these firms were making machines of similar types and had been competing with one another for years, the advantages to the trade in general to be gained by concentration and specialisation outweighed all difficulties, and members of the A.B.M.T.M. arrived at a satisfactory agreement whereby overlapping is eliminated.

The A.B.M.T.M., Ltd., is in no sense a "trust" or "combine," but it is a co-operative effort to improve design and reduce manufacturing costs, with a view to effectively meeting competition and increasing the sale of British-made machine tools. Each works is entirely self-governed, and neither capital nor interests are pooled, but by co-operation it is hoped that greater efficiency will be obtained and better service rendered to clients.

These firms have under consideration the post-War conditions likely to obtain in Great Britain, particularly during the period following the cessation of hostilities. These firms are at present engaged almost exclusively on Government work, and have in view the necessity of making provision for the continuity of production. Messrs. Henry S. Potter, Ltd., are, therefore, making an endeavour to get as many enquiries for machine tools as possible for trade after the War, so as to be ready to supply to the requirements of users throughout the Union of South Africa, Rhodesia and Katanga with the least possible delay. These machine tools are sold under the following conditions:—

"At a definite percentage over landed cost with full discovery of original invoice and all charges to the purchasers, plus a statement of the commission we are allowed on each individual tool."

MESSRS. M. B. WILD & CO., BIRMINGHAM.

Messrs. M. B. Wild & Co., Ltd., Nechells, Birmingham, make a speciality of hauling, pumping and winding machinery and have numerous types of designs which are particularly adapted to coal mining. They issue an attractive abridged list which illustrates, among other designs:—

Winding Gear.—Designed for drawing about 400 tons of coal per day, from about 260 yards.

Double Drum Winding Gear.—Fitted with multiple tooth clutch, so as to give fine adjustment on rope when changing levels.

400 *H.P. Tandem Drum Haulage Gear.*—Fitted with Citroen gear on the first reduction, and straight machine cut on the second reduction. Drums capable of holding 4,000 yards of 1 in. rope, speed 10 miles per hour.

600 *H.P. Main and Tail Haulage Gear.*—Fitted with single reduction gearing. The drums are designed to take 4,000 yards of 1 in. diameter rope at 10 miles per hour, each drum has double brakes and lined with "Ferodo" fibre. The drum shaft is fitted with 4 bearings, so as to make it very rigid.

600 *H.P. Main and Tail Haulage Gear.*—Drums are designed for taking 3,000 yards of 1 in. diameter rope, each drum is fitted to double brake rings and double brake straps, lined with "Ferodo" fibre. The drum shaft is fitted with 4 bearings.

200 *H.P. Main and Tail Haulage Gear.*—Fitted with bedplate so arranged for fixing over ropeway. Gearing is single reduction, with liquid controller; the drums are designed to take 2,000 yards of 1 in. diameter rope. Drumshaft is fitted with 3 bearings, and the brakes are lined with "Ferodo" fibre.

150 *H.P. Double Drum Endless Rope Haulage Gear.*—Fitted with friction clutches; these are of the band type, lined with "Ferodo" asbestos. The first reduction is helical machine cut and the second reduction is steel machine moulded.

100 *H.P. Double Drum Endless Rope Haulage Gear.*—Fitted with friction clutches of the band type, the clutches are lined with "Ferodo" asbestos, and the brake blocks are of wood; the gearing in this case is straight machine cut on the first reduction; the second reduction is straight machine cut, and the third reduction helical machine moulded.

40 *H.P. Main and Tail Haulage Gear.*—Fitted with friction clutch, lined with "Ferodo" asbestos. The first reduction double helical machine cut, the second reduction steel machine cut straight teeth.

80 *H.P. Main and Tail Haulage Gear.*—With drums and gears so arranged that these are above the floor line, with helical machine cut gear on the first reduction, and machine straight on the second reduction.

25 *H.P. Main and Tail Haulage Gear.*—Drums are lifted above floor line; it is helical machine cut gear with first reduction. Helical machine moulded on the second reduction.

30 *H.P. Standard Type Main and Tail Haulage Gear.*—All machine cut gearing throughout. The first reduction is in oil type case, with flexible coupling. The drum sides are mild steel and through boss with cast-iron roll and cast-iron brake rings. Brakes are all the band type, lined with "Ferodo" fibre.

10 *H.P. Haulage Gear Portable Main and Tail.*—Gears are made specially for going into narrow workings, and the machine is driven by a 3-phase Squirrel Cage Motor, and all the operating is done by friction clutches.

7 x 9 *Three-Throw Pump.*—This pump is suitable for heads up to 2,000 ft., each cylinder is separate, each valve box is separate, and each valve box is fitted with quadruple valves, and the outlet is supplied with a spring relief valve. In case the head drops the pressure is relieved, and does no damage to the pump. The top of the crankshaft bearings is tied by means of rods to the top of the cylinder in order to stop any spring.

THE

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Notes and News.

Goldfields and Springs.

The Consolidated Goldfields has acquired a block of Springs Mines shares, according to Lord Harris, the chairman of the Goldfields. It will be remembered that the "Goldfields" also acquired a block of Government Areas when the latter stood at a comparatively low figure. Their success, we may hope, may be repeated in their latest acquisition.

* * * *

Lewis & Marks Join National Mining Corporation.

It was officially announced that Mr. H. D. Lewis, of Messrs. Lewis & Marks, had joined the board of the National Mining Corporation. It is understood that the first deal of the new corporation, in conjunction with the Imperial and Foreign Corporation, is the guaranteeing of the new shares to be issued by the Tanganyika Company for the purpose of redeeming its debentures, and thus clearing the ground for the payment of dividends.

* * * *

The Simmer Deep Settlement.

The Simmer Deep trouble has been settled on the following terms: (1) The question of the original dispute be referred to a Board of Reference. (2) That the personnel of the Board of Reference consist of two independent men, namely, Messrs. H. O. Buckle and T. G. Macfie. (3) That the decision arrived at by this Board will be binding on all parties. (4) That there shall be no victimisation of any kind whatsoever. (5) That, pending the decision of the Board of Reference, work be resumed on Friday, December 26, and Krischker will go down. The terms of settlement are agreed to by all parties. The Board of Reference sat during this week.

* * * *

Mashonaland Consolidated.

Mr. George Scott, consulting engineer to the Mashonaland Consolidated (1912), Ltd., has just forwarded from Rhodesia an interesting report on, with his recommendations for the development of, the company's mining claims out there. In particular, he suggests the spending of an initial £2,000 each on the Crown and Hepworth reefs. The latter he considers to be the most promising of the properties he visited, and he is almost certain that by spending the amount mentioned "a payable mine could be proved." The directors have cabled instructions for the above work, as well as certain operations on other reefs, to be proceeded with immediately.

* * * *

An Important Industrial Flotation.

Just as we go to press we learn that a new industrial corporation with large capital and most influential backing is in the course of formation. We understand that the new company will acquire certain highly important and long established factories connected with the manufacture of explosives in South Africa and that the scope of its activities will be wide indeed. The name of Mr. Kenneth Quinan is mentioned in connection with this amalgamation of existing interests and development of new industries, and we hear that important mining houses are identified with the enterprise.

* * * *

"Therons."

Summing up the position of Theron Diamonds at the annual meeting this week, Mr. H. de v. Steytler said: "There was no doubt in his mind that for the next few years they should be able to treat 300 loads a day at considerably less than 3s. 6d. per load. The diamonds recovered during the period under review, some 527½ carats, had been sold at £1,872, showing a value of £3 11s. per carat. The quality of the diamonds recovered was exceptionally fine and they should always find a ready market. Their last parcel, he might just add, had been valued at £4 15s. per carat. Given normal conditions and a plentiful supply of labour and water, their little company should do exceedingly well."

Dividends.

As one or possibly two more dividends may be declared for the half-year after we go to press this week, our annual table, including totals for the year, is held over till next week.

* * * *

The Rhodesian Strike.

The Rhodesian strike was not over as we went to press, the Falcon, Shamva and Gaika mines of the Goldfields group having declined to accept the Goldfields' new offer of which the Union Executive expressed approval. It is understood that the men on the mines mentioned are sticking out for the full demands, the principle of which was a 25 per cent. increase in wages. The position at the Wankie Colliery is that the men there, who accepted the terms offered them by the management direct, but subsequently stopped work when the union declared a general strike in Rhodesia, have presented a demand for further increases, which have been refused. The Globe and Phoenix, which has not been affected so far owing to a special agreement there which expires at the end of the year, is now brought into the dispute, the men having presented a demand for a 20 per cent. increase on the existing rates as from January 1.

* *

South African Diamond Corporation.

As promised by the chairman, Mr. Bernard Oppenheimer, at the last meeting of the South African Diamond Corporation, Ltd., he now formally offers to the corporation a large participation at cost in the "Bernard Oppenheimer Diamond Works, Ltd.," which is being formed as a private company to take over the diamond cutting factories which he has personally established at Brighton and elsewhere in Great Britain, with the patriotic object of employing men disabled while serving with H.M. Forces. The diamond works are already profit-earning, and the new company which is acquiring them will have a total capital of £1,300,000 in £1 shares, the whole of which will be subscribed by Lewis & Marks (Diamond Branch), Ltd. The South African Diamond Corporation is offered 400,000 shares in the new company at par, and with a view to accepting them asks its own shareholders to approve of an offer to the latter of 200,000 South African Diamond shares at £2 each.

* * * *

Improved Position of Balkis.

The results of the operations of Balkis, Ltd., for the financial year ended August 31 last make a much better showing than those of the preceding 12 months. The profit and loss account shows receipts amounting to £17,567, to which is added £1,391 brought forward, making a total of £18,958; after deducting the expenditure of £2,750, a balance of £16,208 remains at credit of the account, subject to adjustment of income tax, etc. Property account now stands at £52,165, having been reduced during the year by land sales amounting to £22,137, and the company still possesses 186,988 acres in the Transvaal, an undivided moiety of about 43,000 acres in Southern Rhodesia, and mining rights over about 9,000 square miles. Investments stand at £25,827. Assets, which are liquid, or capable of easy liquidation, total £74,824, and this is quite apart from the land and mining rights. The demand for land continues and since the close of the financial year sales aggregating upwards of £9,000 have been made. Altogether, the company's position is satisfactory and the immediate outlook promising.

* * * *

Mines Department Returns.

The Mines Department issued the statistics for November this week. The total mineral production was valued at £4,565,995, a decrease compared with October of £416,993. The gold return shows that 20 ozs. were produced in Natal and the aggregate value of gold output of £2,868,980 showed a decrease of £209,596. The diamond output was 234,220 carats valued at £1,339,938, the decrease being 30,594 carats and in value £207,200. The coal output was 822,180 tons representing a value of £274,896, a decrease of 99,258 tons and in value £39,672. The Transvaal output was 532,955 tons, a decrease of 57,967; the Cape with an output of 467 tons was 64 tons better than the October return. The Free State returned 59,406, a decrease of 7,616 tons, while Natal produced 229,352 tons, a decrease of 33,739 tons. The Transvaal shipped 549 tons of copper, which was valued at £30,724, and the sales and shipments of tin amounted to 112 tons, of which the Cape contributed 3 tons, the total value being £21,685. The number of whites employed in mining was 27,115, an increase of 1,043, and coloureds 255,531, a decrease of 1,325.

* * * *

Grootvlei Prospects.

Speaking at the East Rand Mining Estates meeting, Mr. C. F. Rowsell said that Mr. Isaac Lewis had returned to South Africa, and his work would be to go closely into the arrangements necessary for the immediate commencing of shaft sinking and development on the Grootvlei property. Every precaution would be taken to secure the best advice procurable. What he (the chairman) was anxious should be secured was a record in rapid shaft-sinking and development, and he saw no reason why they should not be successful in securing such a record. The Grootvlei Mines adjoined some of the most successful of the Far East Rand propositions, and everything pointed to the fact that the Grootvlei Proprietary Mines would be equal to any which had so far been developed. It was exceedingly satisfactory to know that from now onwards their company would every day be nearer to the time when they would own a very great interest in the producing property. The Grootvlei Proprietary Mines had only acquired from their company its gold mining rights. The next important asset which their company had in the Grootvlei Farm, in consequence of their having retained the freehold of the property, was in connection with the township. Steps were now being taken to sanction the formation of a township.

* * * *

World Labour Meetings.

Several international conferences are now being held at Washington. One of these is the conference authorised under the Peace Treaty, and the delegates from the various countries have been welcomed and will proceed with their deliberations despite the fact that the United States Senate has not yet ratified the treaty, and is not, therefore, entitled to have delegates in the conference. The International Federation of Trades Unions, which met at Amsterdam last July, was to have opened an adjourned session at Washington on October 27, but was delayed because of the non-arrival of some of the delegates. For the consideration of delegates to the conference meeting under the League of Nations, a complete file of reports bearing on the laws and customs of the world as they have been applied to the shorter working day, elimination of unemployment, maternity insurance, protection of women and children in industry, and other questions, has been prepared by the organising committee created to formulate plans for the conference. The reports bring together, for the first time, complete governmental data as to the status in the principal industrial nations of the measures of labour protection specifically named in the treaty for action by the conference. These include the questions of the forty-eight-hour week, unemployment, maternity care, conditions of employment for women and children, and the extension and application of the international conventions adopted at Berne in 1906. It should be made clear that it was the American steel strike conference dealing with domestic questions in that industry that broke up on the "open shop" question.

* * * *

Sir W. G. Armstrong, Whitworth & Co., Ltd.

Mr. J. M. Faulkner presided over the twenty-fifth annual meeting of this company in mail week. He said that with the Armistice came a fresh series of difficulties so far as the company's accounts and finance were concerned, chiefly connected with the cancelling of orders by the Ministry of Munitions and the Admiralty. Although much progress had been made, he should be again compelled to move the adjournment of the meeting until such time as the accounts could be completed and presented. Their new departments were already delivering material and earning revenue, and they should have accomplished a notable commercial feat if they could transform almost the whole of their works without affecting the interests of their shoreholders. He pointed out what he had not ventured to say before—that they had every confidence, assuming ordinary industrial conditions, of being able to bridge over the interval which separated the new from the old. During 1920 their peace work ought to be in full swing, and they were quite alive to the necessity of improving their system as well as their shops. In coming to the meeting for authority to add to their capital they were putting before them the proposition of supporting a business that had greatly increased and would increase still further. They proposed to issue 1,500,000 ordinary and 1,500,000 6½ per cent. third preference shares. The necessary resolutions were subsequently adopted.

* * * *

Mayo (Rhodesia) Development.

The report of the Mayo (Rhodesia) Development Company (1908) for the year ended 31st July last states that the authorised capital of the company amounts to £175,000 and the issued capital, 152,007 shares of £1 each, being the same as at 31st July, 1918. The company owns 309 claims, 37 claims having been abandoned during the year. In addition to the claims, plant, etc., at the close of the year, the company held £16,083 investments at cost, £104,822 shares and debentures in other companies at cost, and had £7,235 at bankers and £28,131 on loan against securities. The loans from bankers and others owing by the company amounted to £24,821. With reference to investments (£16,083), these were all quoted on 31st July last and show a deficiency of about £3,430. The £21,300 debentures of the United Rhodesia Gold Fields, Ltd., the 3,228 eight per cent. preference shares and the 4,245 seven per cent. preferred ordinary shares of the Union Steel Corporation (of South Africa), Ltd., are not quoted and stand in the books at £25,958. The remaining shares and debentures other than the shares of the United Rhodesia Gold Fields show an appreciation of £4,179, but the 77,831 shares of the United Rhodesia Gold Fields show a depreciation of £13,506. Proposals to increase the capital of the company and to acquire the interests of the United Rhodesia Gold Fields, Ltd., will be found elsewhere.

* * * *

United Rhodesia Gold Fields.

The report of the United Rhodesia Gold Fields, Ltd., for the year ended 31st July last states that on 31st July, 1919, the gold mining claims registered numbered 286 claims. At 31st July, 1918, the total amount of development work standing to the credit of the company was 68,580 feet, to which must be added development work done on properties during the past year amounting to 1,093 feet, making a total of 69,673 feet. About 74 per cent. of the shares were quoted on 31st July last, and on this proportion there was a depreciation of £77,398. Of this amount £71,559 is due to the low market price of Mayo (Rhodesia) Development Company (1908), Ltd., shares. The directors consider the assets of that company justify a considerably higher value. Results of the year show: Tons crushed, 10,021; fine gold, 3,142·64 ozs.; value, £13,168; royalty to company, £656. Royalty is exclusive of the British South Africa Company's royalty of 2½ per cent. The tributors' returns for the year show a falling off compared with the previous year. The principal producer at present, the Cambrian Mine, shows a decline of nearly £5,000, with a consequent reduction in the royalty received by the company. This is primarily due to a considerable falling off in the grade of ore treated. It will be remembered, however, that during the year ended 31st July, 1918, a very high grade ore was treated for some months, but the grade afterwards fell off. During the present year the ore treated has been of lower grade, but more uniform. The influenza epidemic, too, caused a stoppage of crushing operations for two months, and accidents to machinery still further handicapped the tributors owing to the difficulty of procuring new plant and spare parts. Proposals are made to liquidate the company and to amalgamate with Mayo (Rhodesia) Development Company (1908).

TOPICS OF THE WEEK.

THE OUTLOOK FOR 1920.

Thoughtful observers are inclined to regard the outlook for South Africa in 1920 with confident optimism. It is true the imminence of a General Election does not make for equanimity, and that the triumph of extremist politicians, whether of the Nationalist or Labour camps, would threaten the ordered economic progress of the country. Again, the ever-increasing cost of living does not tend to alleviate our labour troubles, and these, unfortunately, cannot always be confined to the white employees. Native labour shortage, indeed, seems to become more serious as the days go by, and is to-day proving a direct handicap to industry. Against all these, there are several highly favourable factors to be taken into account. The gold premium, described by one leader of the industry as "a substantial support," seems to have come to stay. Diamonds, likewise, are a rising market, making for the prosperity of those engaged in alluvial diggings and small mines as well as of the fortunate proprietors of the big producers, chief of which is the Union Government. For South African coal, the outlook was never better and brighter, as our Special Coal Number will abundantly prove; and for base metals, tin, copper and lead all the latest quotations point to a steady and improving demand. Of agricultural and pastoral production, it is not for us to speak, but it is a significant fact that Lord Harris at the recent "Goldfields" annual meeting spoke of a meeting held in London to discuss the industrial development of this country, presumably with British capital and in accordance with the new industrial policy of the big South African financial houses. On the same occasion Lord Harris declared that there were very strong indications that industrial business in this country was going to develop rapidly, and that South Africa would become more and more self-contained, and, by degrees, more and more capable of exporting its raw or manufactured produce. "Already," he said, "it has been recognised that there are large coal areas which only require transport facilities to enable them to make up for shortage in other parts of the world. Every year the agricultural production from the soil increases, every year the confidence in the capacity of the country to maintain larger herds increases, and, as I told our shareholders at the meeting of Gold Fields Rhodesia, that company has now started a herd of its own. We know there is going to be a world's meat shortage presently; we know there is going to be a timber shortage presently, and in this and other directions South Africa is eminently capable of supplying itself. It wants capital to do so, and with remunerative possibilities for investment of capital in industrial concerns there, and without comparing the relative advantages of mining and industrial propositions in South Africa, we did not wish to be behindhand in the opportunity of investment in industrials." Lord Harris had also something very sane and far-seeing to say about labour, which applies equally here and in Great Britain. "As regards the labour difficulties before us, which it would be folly to ignore," he said, "I see no cause for discouragement, provided, as I have already said, that by tact and discretion in accommodating the relative interests of capital and labour, sudden and severe disturbances may be avoided. It is indisputable that the world, owing to its devotion for five years to the manufacture of material for war, is short of many commodities which it sorely needs in ordinary times. Exhortations have been published which are mainly directed to labour to do all that it can to increase produce; but labour, whether its interest is primary or not, can do very little without capital, and, therefore, such exhortations should not be limited only to labour, but should be extended also to those who have capital to invest in the re-establishment of industrial concerns within the Empire, which will enable us to take advantage of the world's shortage and to maintain and, if possible, improve our position as a great manufacturing and producing people." Increased production is indeed the big desideratum of the moment and forms the burden of every statesmanlike address in England and America, as it ought to in this country. To this end all can help: the Government by removing all unnecessary restrictions on enterprise; capital by a bold and generous industrial policy; and all of us who labour, by working and saving more.

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THE YEAR WITH THE MINING INDUSTRY.

A Critical Review of 1920 with Reference to Gold, Diamonds, Coal and Base Metals in South Africa.

I.—The Year on the Rand—Labour's Demands and the Plight of the Low Grade Mines—The Gold Premium to the Rescue—Events on the Far East Rand—A Period of Changing Fortunes.

The year 1919 has now drawn to a close, and in writing the obituary of a period which has had more than a twelve months' share of event, one is at a loss how best to depict an impression of changing fortunes and wholly abnormal conditions in so far as they have affected South African mining. To consider for a moment the past year in its broadest aspect it may be truly written that whilst the four years of the Great War were the most momentous in the history of the world, the year of Peace when analysed is found to have contained events which are of even more profound moment than the period of conflict. For Peace, whilst it has silenced the guns of opposing nations, has not stilled the turmoil of the classes, nor has it rescued Europe from the chaos to which it has been rushing for decades and of which the Great War was only an incident, although a mightily important incident. South Africa happily stands outside the maelstrom of the older nations. Few countries have suffered so little in consequence of the War as this; few countries, too, have realised so much prosperity as the Union of South Africa. But although we have stood without the ring of combat all the grim and wondrous turmoil of that zone has impinged in some form or other upon our daily rounds and common tasks. Labour has arisen like a leviathan out of the remnants of the stricken nations—one cannot be amazed that the men who have fought battles should demand their entrance into the councils of peace. South Africa has caught the reflex of Labour's demands, although comparatively few of her inhabitants were engaged on the battlefield, and the growth of Labour's strength and the seemingly insatiable lust of Labour's demands must be accounted one of the most marked features of the history of the past year in South African mining.

THE AUTOCRACY OF LABOUR.

No person who rightly treasures truth can deny that in the past the captains of our industries have not always given a fair audience or just answer to the mighty voice of Hoi Polloi. But one is now tempted to ask whether that voice is not becoming unduly clamorous and whether the autocracy of Labour is not more autocratic than the autocracy of vanquished Potsdam, and this we write of South Africa and her industries and particularly her main industry of the Witwatersrand advisedly, because the voice of the true labourer who has proved worthy of his hire is stifled by the despotism of the Labour Party's policy. "Sickespensi" may only be a Shangaan. But nevertheless he is the essential factor of the mining industry, and if Labour is really sincere in its doctrines the Shangaan has just as much right to a fair hearing as the agriculturist who has recently become miner, or the miner who just as recently has turned politician.

THE LOW GRADE MINES COMMISSION.

The menace of Labour's unreasonable demands has hung threateningly over the mining industry throughout the greater part of the past year and particularly has it menaced the position of the low grade mines. The dramatic conclusion of the War has brought about no dramatic reduction of working expenses. On the contrary the prices of commodities and the costs of living have readily responded to the actions of strikers and of profiteers in other countries and in this. In the earlier months of 1919 the economic situation was of so unpromising a nature that the continuance of operations at nearly half the mines of the Witwatersrand was problematical. At a well-chosen period the President of the Chamber of Mines drew the attention of the Government and of the public at large to the dangers of the situation. His letter was commonly referred to as "Wallers' Bombshell," although for months previously it had been abundantly evident to every thinking person that an industrial crisis was approaching. As a consequence of the definition of the situation by the President of the Chamber of Mines the Government once again prescribed its never-failing panacea for all evils. A Commission to enquire into and advise upon the position of the low grade mines was constituted, and throughout a goodly portion of the past year this Witenagemot of industry listened to a vast amount of evidence, the bulk of which was of a singularly informative nature. A few witnesses managed to unburden themselves of a good deal of "hot air," but on the whole the evidence given threw a most illuminating light on the many problems of the Witwatersrand and clearly showed that the fate of numerous low grade mines was trembling in the balance and that the whole industrial aspect of the Union was so indissolubly wrapped up in the mining industry that the prosperity and good name of the country at large were in jeopardy. As yet the Low Grade Mines Commission has borne no fruit whatsoever. The Commission issued an interim report and advocated certain important reforms in regard to the employment of natives and also in connection with experimental recruiting from northern latitudes. But so far the Government has not acted in the direction of these recommendations. Perhaps the elections are too imminent for action in matters which are so controversial, although it is unthinkable that anything but good would result from the adoption of the Low Grade Mines Commission's recommendations. The fact remains that no assistance has come to the industry from the Government. On the contrary further burdens have been piled on, as witness the new phthisis legislation, for instance.

THE PRICE OF GOLD.

Salvation has come not from the Government but from a cause of the Great War and the new and complex conditions which have resulted from the struggle. Shortly after the close of the half-year it became known that the acceptance of a standard value for gold had gone the way of most pre-War standards of value. Gold in fact was to be sold at a premium. America and India have been the principal buyers of our product, and in the open market the price has gone as high as 111s. 3d. per fine ounce. Whether this price will be maintained, whether it will increase or decrease

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[illegible] period a premium will obtain is dependent on [illegible] factors that he would be an exceedingly bold man who would attempt to predict the future fortunes of gold in the metal markets. One can, however, make the assertion that gold to-day is at the caprice of supply and demand, like any other commodity, and in the absence of any new and important discoveries of gold fields, the present demand for the metal is at least likely to maintain a substantial premium on gold for some considerable time to come.

Individual Mines.

In so far as sections and individual mines of the Witwatersrand are concerned, interest has again chiefly centred in the Far East Rand, which has greatly increased in production and popularity. In the earlier months of the year confidence in the great mining annexe of the Central Witwatersrand was somewhat disturbed by a large decline in the profits of Springs Mines, and this naturally was accompanied by a very substantial slump in the price of the shares. It has since transpired that this was due to an absence of stope faces rather than to any diminution in the value of the pay shutes, and the company having gone through the crucible of criticism and denunciation is now understood to be in an eminently sound position and capable of earning considerably larger profits than recently have been declared. From a market point of view the slump in Springs, the rapid appreciation in value of New Modders and Modder Deeps (consequent on excellent developments and the splitting of the shares), together with the marked changes for the better in the development fortunes of the Modder East and Springs West, have constituted the outstanding features of the year on the Far East Rand. There has been little of interest to record in regard to the Central Rand. The premium on gold has certainly saved numerous long-established properties from cessation of work. As to the West Rand, interest has principally centred around the successful deep borings on Randfontein and the revival of interest in the Western Rand Estates.

It is as yet too early to give statistical details of the year's output, profits and working costs. Until more exact details in regard to the incidence of the gold premium upon returns of individual companies are available it is impossible to present an accurate view of the statistical economics of the year's work on the world's largest goldfield.

Elsewhere in this issue, however, will be found a statement of dividends just declared in respect of 1919 operations, and in a further and early instalment of this review we hope to be able to give the year's results in detail.

(To be continued.)

British Tractor Evolution.

The recent trials of agricultural tractors held in England were highly satisfactory and reveal some interesting tendencies of design among the British makers. Owing to the heavy soils so frequently met with in England and Scotland it is being found that the slower speed engines with ample power give better results than the light and more attractive types. The serious wear and tear due to agricultural conditions confirms the drift towards solid and simple design; and in view of the unskilled attention which tractors generally get it is being found advisable to seal up vital parts so that amateur fingers will not be tempted to interfere with them. A British firm seized the opportunity presented by the trials to give a demonstration of the double-engine cable system of ploughing, using internal combustion engines. A double-ended plough is hauled backwards and forwards by means of cables wound on drums. It is claimed that a set of this tackle can plough from seven to ten acres in one day. The engines are adapted for use as tractors on the road or for driving stationary machinery.

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THE YEAR WITH THE CONSOLIDATED GOLD FIELDS.

Mining and Financial Conditions Reviewed—The Low Grade Mines' Position—Points from the Annual Reports.

OTHER INTERESTS.

Movene Sugar.—The latest details concerning this venture will be found in the assistant manager's report.

Trinidad Leaseholds, Ltd.—Satisfactory results continue to attend the operations of this company. The production for the year to June 30, 1919, amounted to 171,535 tons, as compared with 145,000 tons for the previous year. Further selected freehold lands and oil rights have been acquired on the recommendation of the geological staff. The paid-up capital has been increased to £1,049,250 by the issue to shareholders of 349,750 shares at 45s. per share, and a portion of the working capital so obtained is being devoted to the development of some of the ground recently purchased.

Consulting Engineer.—In view of the approaching termination of Mr. C. D. Leslie's engagement Mr. David Wilkinson, a mining engineer of long and tried South African and general experience, has been appointed consulting engineer to the company.

Staff Provident Fund.—For some time past the problem of providing for the staff when age or ill-health compels their retirement has engaged the attention of the board. Hitherto the few isolated cases that have occurred have been considered and dealt with on their merits, but the time has come when some retiring allowance for the staff, many of whom entered the service of the company in its early days, must be provided. After mature deliberation a provident scheme was evolved and brought into operation as from June 1 last. The main feature of the scheme is that each member of the staff is allowed to subscribe a percentage of his salary according to length of service up to a certain limit, and for every £1 subscribed the company add £1. The cost to the company for the first few years will be approximately £3,900 per annum, gradually becoming smaller as the older members of the staff retire.

Meeting, Cannon Street Hotel, December 4, noon.

THE CONSULTING ENGINEER'S REPORT.

The Consulting Engineer, Mr. C. D. Leslie, in the course of his report, states:—

During the period work was continued on the Simmer and Jack Proprietary Mines, Robinson Deep, Knights Deep, Simmer Deep, Jupiter, and Sub-Nigel Mines. Compared with the previous year the ore treated was lower by 296,880 tons and the profit reduced by £373,728, as a result of £164,594 less revenue from gold added to higher working costs of £209,134. The working of Knights Deep, Simmer Deep and Jupiter Mines resulted in losses of £20,572, £46,043, and £5,917 respectively, which brought down the total profit of the mines of the group for the year to £80,873. Sub-Nigel contributed less than 4 per cent. of the tonnage milled by the group, but yielded a profit of £88,558. The position is more fully set forth in the following table:—

	Year ended 30 6 18.	Year ended 30 6 19.	Difference compared with previous year	Per cent.
Ore milled—tons	3,329,480	3,032,600	— 296,880	— 8·917
Yield of gold (fine oz.)	839,866	797,128	— 42,738	— 5·089
Revenue from gold	£3,509,510	£3,344,916	— £164,594	— 4·690
Working expenditure	£3,054,909	£3,264,043	+ £209,134	+ 6·846
Profit	£454,601	£80,873	— £373,728	— 82·219
Value of ore per ton milled	21 0·977	22 0·716	+ 11·739	+ 4·640
Working costs per ton milled	18 4·208	21 6·316	+ 3 2·108	+ 14·305
Profit per ton milled	2 8·769	6·400d	— 2 2·369	— 80·469

A sum of £16,012 charged to renewals and replacements during the year has not been included in the amount shown under working expenditure.

The following are among the chief causes of the disappointing results for the year:—

Reduced rate of output per employee.—The decline here was equivalent to the additional employment for the year of 252 white men and 1,306 natives. The impaired efficiency was largely a result of unsettlement among white employees, noticeable especially in a section of the less skilled miners, who have not shown the diligence and economy, or the desire to conform with proper discipline, that should be expected from them. Their slackness proved infectious, and it has to be noted that there is a pronounced increase in the number of shifts lost through unauthorised absence from work, which is proving very expensive, and also a tendency towards sectional interruption of work on very slender pretext.

Higher Wages.—Increased pay to white employees as compared with the preceding year has added a further 6.164d. per ton milled, equal to £77,900, and the cost of living since war started is estimated to have risen by 29 per cent. in June, 1918, and by 32 per cent. in June, 1919. Collective bargaining for improved conditions in employment has become general, and further adjustments are impending. The following are instructive figures, showing the ruinous effect of higher wages when accompanied by a lower rate of production:—

	Average No. employed.	Labour costs per ton milled.		
	Year ended 30 6 19.	Year ended 30 6 18.	Year ended 30 6 19.	Increase.
Whites .. .	2,687	5 10·112	7 0·181	1 2·609
Natives	19,940	5 4·941	5 11·553	6·612
Total. .	22·627	11 3·053	12 11·734	1 8·681

ANALYSIS OF PRECEDING FIGURES OF LABOUR.

	Cost per ton milled Due to higher wages. d.	Due to lower average output per man d.	Total.
Whites	6·164	7·905	1 2·069
Natives	2·824	3·788	6·612
	8·938 43·5%	11·693 56·5%	1 8·681 100%

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Applied to the total of 3,032,600 tons milled during the year by the six producing mines of this group, the 1s. 8·68d. per ton increase in labour cost is accountable for a loss of £281,322, of which 56·5 per cent. or £147,647, represents the loss from decreased average output per man. It is estimated that, had the output per employee been converted from the actual decrease of 6·9 per cent. to an increase of 5·3 per cent., the whole of this increase in labour cost of £261,322 would have been reflected as an addition to the total actual group profit of £80,873 for the year, and there would have accrued a still further profit on revenue from the additional tonnage thus produced. In achievement in this direction, for which there is much scope, lies the solution of the big problems, involving greater employment, improved conditions for the workers, and bringing into commission tens of millions of tons of Rand ore which now must be classed as unpayable, besides favourably influencing other important considerations affecting expansion in mineral production and the progress of South Africa as a whole.

The increased cost of mine supplies, amounting to 1s. 6·739d. per ton milled, equal to £236,783, must not be attributed wholly to rise in prices on account of the War, since it, also, is largely a result of reduced output per employee. The urgent need, therefore, is for skilled work and economy of time in order to increase the output, reduce the cost per unit produced, and avoid waste of mine supplies. The trend of affairs indicates that much suffering will ensue before the workers fully awaken to the fact that efficient service must be the outstanding means of securing permanent benefits for themselves.

On January 1, 1918, the underground working time was reduced from 48 hours "face to face" to 48½ hours "bank to bank." In last year's report special reference was made to the marked decrease in output from these shorter hours of work.

The Assistant Manager's Report.

The report of Mr. F. Leslie Brown and Mr. C. Hely-Hutchinson, the assistant managers, states:—

The results are very disappointing, but it is at least encouraging that all of the companies of the group are still producing gold after five years of war conditions and in spite of the onerous burdens which they have had to carry during that period. Consideration of future prospects must be based mainly upon a judgment of what we can expect in the way of betterment of all the factors that have contributed, especially during the last two years, to the difficulties and increased cost of mining. Taking the broad view, these factors can be stated under three main headings:—(a) Increased cost of materials; (b) Government taxation; and (c) labour, cost, and efficiency.

(To be continued.)

Mine Rescue Discoveries.

Some exceedingly interesting discoveries have been made by British investigators in connection with mine rescue apparatus. This apparatus is supplied with oxygen to make up for the foulness of the atmosphere through which the rescuer moves in a mine where there has been an explosion. Dr. J. S. Haldane, M.R.S., experimented with the rescue apparatus and found that the extra supply of oxygen enabled him to walk faster and with greater comfort than he could do in the open air even without the weight of the apparatus. Trials made with miners, however, brought out the unexpected conclusion that men who were accustomed to the atmosphere of mines did not find the same benefit. Their lungs had become adapted, through years of hard physical labour, to make fuller use of the oxygen in the atmosphere and therefore no additional oxygen was needed. Dr. Haldane's general conclusion from this and other research is that full use should be made in industrial work of the marvellous powers of adaptation possessed by the human body, but that close study is needed to prevent these powers being overstrained.

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THE MANGANESE DEPOSITS OF SOUTH AFRICA.

Brief Review of the Chief Discoveries in the Union and Rhodesia.

From a monograph on manganese issued by the Mineral Resources Committee of the Imperial Institute, we take the following references to South Africa:

In a report on the manganese deposits in the South West districts of the Cape Province, A. B. Welsh, Assistant Inspector, gives an account of deposits of manganese ore investigated by him at Hout's Bay, Constantia Nek, Kegel Bay (in False Bay), Botha's Halt near Worcester, Du Toit's Kloof near Wellington, French Hoek and Caledon. In a covering report, the Deputy Inspector of Mines points out that Cape ores are characterized by a comparatively low percentage of manganese and a relatively high proportion of phosphorus, the ores falling considerably short of the requirements necessary in the manufacture of ferromanganese and spiegeleisen. The quantities of ore available are generally not large, the market for them is restricted, their average value is only about 30s. per ton, and costs of mining and transport are heavy. The exceptional case as regards mining and sorting charges is the deposit at Caledon, which on that account is the most interesting, and the most likely to be exploited. This deposit is situated two or three miles from Caledon station, which is 87 miles by rail from Capetown. Unlike the other deposits, which are referred to as "lodes," the Caledon deposit occupies a kopje roughly circular in shape, with hot springs at the centre. Nearly the whole of the kopje consists of manganese ore. In many places there is little or no overburden, and the ore could be worked by open quarrying. The deposit covers an area of roughly 200 by 300 yards. On the top of the hill there are shafts and workings about 20 feet in depth and still in ore. The deposit thins out and becomes more siliceous as the outer margin of the kopje is approached. Assuming an average thickness of 10 feet, the available ore is estimated at about 500,000 tons. A sample of the best ore showed on analysis 37·87 per cent. of manganese, 16·3 of iron, 0·014 of sulphur, 0·378 of phosphorus, and 6·55 of silica. An average sample was found to contain 25 per cent. of manganese and 30 per cent. of iron. It is pointed out that, although the excessively high content of phosphorus would render it quite unsuitable for making spiegeleisen, the ore could be used for the manufacture of basic phosphoric iron. The quantity of ore required for that purpose, however, is not very great. As difficulties standing in the way of exploitation, it is pointed out that a sanatorium and baths have been built on the deposit, and there is a possibility that mining would interfere with the working of the springs; whilst the distance from Capetown is a serious consideration. Of the other deposits investigated, only two, namely, those at Du Toit's Kloof and Hout's Bay, appeared to be of any considerable extent, so far as could be judged from surface indications and the development done. The following table compares these three occurrences roughly, according to their most important constituents, the figures being approximate:

	Manganese. Per cent.	Iron. Per cent.	Silica. Per cent.	Phosphorus. Per cent.
Caledon	38	16-20	6·5	0·378
Du Toit's Kloof ...	40	13-22	0·75-1	0·47-0·57
Hout's Bay	30	9-16	6·00-12	0·47-0·66

The figures refer to clean hand-sorted ore. In every case, the total phosphorus is very high. The Caledon deposit seems to very much more extensive than either of the others, and the ore there can be quarried, whereas at the others vein mining will be required.

Transvaal.—Pyrolusite occurs in the form of veins in the neighbourhood of Pretoria, but the veins are small and the mineral is much mixed with gangue. A few tons per month are being mined in this locality, for use in the cyanide works of the Witwatersrand gold mines.

Natal.—Manganese ore occurs in Natal, and, although no output is included in statistics of the world's production, small shipments have occasionally been made. A superficial deposit of manganese ore occurs in the bed of a stream on the farm Dwaalhoek, in the Vryheid district, near the Pivaan River. The underlying formation is described by F. H. Hatch as consisting of quartzites, jasper-iron schists ("calico rock") and sericite schists belonging to the Barberton formation (Swaziland System), with traces of oxide of manganese in the schists. The deposits of manganese ore, which consist chiefly of pyrolusite, together with wad and psilomelane, appear to have been produced by the leaching out of the oxide of manganese in the schists, this becoming locally concentrated, together with limonite, in a surface deposit in which fragments of shale and quartzite are cemented to a breccia. The deposit has a length of 75 feet, with a maximum width of 15 feet. A shaft, sunk to the east to a depth of 75 feet, in the hope of striking its downward extension, passed through shales containing only traces of manganese, finally reaching quartzites. A sample, taken by Hatch from a dump of about 10 tons of ore extracted from this deposit, contained 26·21 per cent. of manganese, 24·13 of iron, 11·26 of silica, and 0·025 of phosphorus, showing the mineral to be a low-grade ferruginous manganese ore, which could not be profitably mined. Another area examined by Hatch, on the farm Goedegeloof, Nyalisa, some 50 miles from the railhead at Hlobane, showed shales of the Barberton formation locally and superficially impregnated with manganese ore. The workings were confined to an area about 250 feet in length by 150 feet in width, and consisted of pits and cuttings in the shale, at the foot of a quartzite hill, in comparatively flat country. The formation consists of red sandy shales impregnated with small seams and nodules of manganese ore (psilomelane, wad and pyrolusite), together with a small quantity of rhodonite. One shaft had been sunk to a depth of 20 feet, and showed that the manganese impregnation extends to a depth of only 17 feet, the manganese ore constituting roughly 10 per cent. of the whole material intersected to that depth. A bulk sample of hand-picked material contained 33·41 per cent. of manganese; 12·45 per cent. of iron; 16·66 per cent. of silica; and 0·051 per cent. of phosphorus. A sample of more closely picked ore shipped to England is reported to have contained 48·18 per cent. of manganese; 4·9 per cent. of iron; 7·6 per cent. of silica; and 0·046 per cent. of phosphorus. Even on this analysis, the ore can only be regarded as second class, although its silica and phosphorus contents are so low. Other deposits, of a similar nature, occur in the district, as at Bellevue and Kruisfontein, and at Baviaan's Kranz, on the Pivaan, near its confluence with the Pongola River. It would appear that these deposits are not of sufficient size, and the ore is not of sufficient purity, to allow of profitable working. The manganese ores of Natal, even when most carefully hand-picked, cannot be brought up to a 50 per cent. manganese grade, and in view of this fact, as well as of the high cost of working material of their character and the heavy transport and freight charges that shipments would have to pay, Hatch concluded that the idea of establishing a manganese industry in the Colony was impracticable.

Rhodesia.—So far as is at present known, ores of manganese are very sparsely distributed throughout Rhodesia. Lateritic manganese ore occurs in the neighbourhood of the Somabula diamond workings, but not apparently in considerable quantity.

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POSITION AND PROSPECTS OF THE VAN RYN GOLD MINES.

Points from the Report of the Managing Director.

The report of the Van Ryn for the year to June 30 last states that the net profit for the year from all sources amounted to £53,130, and £34,710 was brought in, making a total available profit of £87,840, appropriated as follows: Written off for depreciation, £179; dividends 30 and 31, £50,000; carried forward, £37,661. During the year the mill, with accessory tube mills, crushed 400,860 tons of ore, yielding 96,477·41 ounces of gold, value £402,786 (20s. 1·153d. per ton). Working costs amounted to £341,023 (17s. 0·175d. per ton), leaving a working profit of £61,763 (3s. 0·978d. per ton). A comparison with last year's results shows a reduction of 9,440 tons in the quantity of ore treated and of £57,963 in the value of the gold won, equal to 2s. 4·356d. per ton. On the other hand, the working costs show an increase of 2·578d. per ton, resulting in a decrease in the mining profit of £54,337.

Apart from the gradual reduction in the value of the ore treated from the mine during the past few years, the reason for which was fully explained by the Managing Director in his report for last year, his report for the period now under review demonstrates the difficulties under which operations have been carried on. The chief of these has been the shortage of native labour, which has prevented a sufficient tonnage being mined to permit of normal sorting. Instead of last year's average of 7·05 per cent., poor rock being discarded, the figure of 3·35 per cent. only could be maintained. With reference to the dividends paid in respect of the financial year, it will be noted that the final one was free of income-tax, which represents an increase of 3s. 6d. in the £ as compared with the interim dividend No. 30. Dividends paid since the inception of the company amount to £2,632,000. The payable ore reserves at June 30 last show 1,287,520 tons of fully developed ore of an average value of 5·7 dwts. per ton, a decrease of 60,396 tons in quantity, but an increase of 0·1 dwt. per ton in value as compared with the position at the close of the previous financial year. The Managing Director explains that the decreased tonnage and the increased value are both due to the fact that narrower stoping widths were taken in arriving at these estimates. He also points out that a considerable quantity of payable ore will, in addition, be rendered available from reclamation work resulting from the sand filling operations now in progress. As heretofore, no credit appears in the balance-sheet for these reserves, the cost of which has been met out of past profits. Capital expenditure has been of a negligible quantity, amounting to only £76.

The agreement with the Bank of England, under which the British Government purchased the whole of the production of South African gold during the War, terminated on July 24 last. Under that arrangement the mines received only the standard value for their gold, although a premium was, in fact, obtainable. In addition, the mines had to pay considerably more for freight and insurance than before the War. Under a new arrangement with the Bank of England the mines are free to sell their gold in the best market and are now disposing of it at a premium of at least 15 per cent. over the standard price. On the basis of the last year's output the increased revenue from this source, provided this premium is maintained, represents about 12 per cent. on the capital of the company. The directors draw the special attention of shareholders to the remarks of the Managing Director on the subject of the heavy taxation imposed on the mining industry in South Africa. Sir George Albu makes special reference to the assessment under the new Miners' Phthisis Act, and, keenly sympathetic as he is with all forms of suffering, and incidentally with those under the terrible scourge of tuberculosis, points out that the amount of compensation provided under the new Act is far beyond that legislated for in any other country. The main point of his criticism is, however, that the fund is not contributed to either by the workmen or by the Government, the mining industry alone being obliged to bear the enormous burden thus occasioned. The directors endorse the remarks of Sir George Albu and trust that the South African Government will introduce such legislation as will afford the mines some measure of relief from a policy, the effect of which, if continued, may easily result in the closing down of many of the low-grade properties.

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Phone 4368.

RESULTS OF NOVEMBER, 1919, SURVEY EXAMINATION.

Total Men Passed ... .. 7 (four conditional).
Our Students, Passed . 6
Students from other coaches
Passed .. .. .. Nil

We have secured the larger proportion of the Overseers' passes during 1919 and 1918. In the last (Sept.) Managers' examination we secured 50% of the total metalliferous certificates granted, and in the previous examination the larger proportion of the total passes. Write for particulars and class time table.

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PROSPECTING IN THE S.-W. PROTECTORATE.

Official Arrangements Announced—Provisions Regarding Claims.

In connection with prospecting in South-West Africa:—(1) It has been decided that a prospector's licence must be taken out, owing to prospectors being permitted to have access to private farms as well as Government land. (2) The licence will be issued by the Magistrate in whose district the prospecting is to take place. A fee of 2s. 6d. a month will be charged, and, moreover, the prospector must satisfy the Magistrate that in case of damage resulting from operations adequate compensation will be forthcoming. (3) Prospecting is not permitted in the Ovamboland and Otavi Mines and Railway Concession, the Sperrgebiet, and a few small areas held under title. (N.B.—The Sperrgebiet is the territory bounded on the north by 260 latitude, on the south by the Orange River, on the west by the Atlantic, and east by a line drawn parallel to the coast 100 kilometres distant.) (4) Prospecting is permitted in the territory of the South-West Africa Company, Ltd., in terms of the Mining Ordinance of 1905, subject, however, to the modifications laid down by the company. (5) Prospecting for diamonds is forbidden in the Kaokoland concession in the South-West Africa Company concession. The finder of a payable diamond mine is given £1,000. The diamond rights and these two concessions are held by a company in the Union. (6) The size of a precious mineral claim is 200 x 400 metres, and that of a base mineral claim is 600 x 1,200 metres. The claim licences are 10s. and 5s. respectively per month, which monies must be paid for a period of not less than six months. (7) All claims pegged must, after a lapse of time, be worked. The conditions are laid down in the Mining Ordinance. (8) Although prospecting is permitted for two months before pegging, no priority rights can be given to discoverers. The period of two months was granted only to enable persons living outside to visit the Protectorate, and thereby be placed on an equal footing with residents there. (9) A map showing the areas under mining title is being prepared, and should be available at the Government Printing Works at Pretoria before the end of December. The Mining Ordinance, with amendments, will be published in Windhuk on the same date.

NEW 7,000 FEET CIRCULAR SHAFT AT THE CITY DEEP.

New Circular Shaft: Shift Going Down.

Temporary Headgear: New Circular Shaft.

ANSWERS TO CORRESPONDENTS.

All enquiries addressed to the Editor must bear the writer's name and full address. We cannot reply to enquiries by letter, but telegrams with replies prepaid will be answered. Correspondents are requested to write their names and pseudonyms distinctly.

"Anxious."—The extracts from the chairman's speech given in this issue answer your question.

"Innes."—The prospect is, we understand, being opened up, but it has not yet been floated as a company. Will print full details as soon as possible.

"Shareholder."—(1) 3s. 6d. per share. (2) Premium has not been taken into account.

"Boksburg."—(1) The New Modder paid a total of 56s. per share for 1919.

"F. S."—(1) The shares are dealt in in London, and have lately been an active market. (2) Kimberley.

PERSONAL.

Mr. Samuel Evans and Mr. H. C. Hull have returned to the Rand.

* * *

Lt.-Col. Templer, late R.A.F., has returned to the Rand and resumed duty as Resident Engineer to the Ferreira Deep. Col. Templer's last chief at the Air Board was Mr. W. McC. Cameron, well-known on the Rand.

Middelburg Steam Coal.

For the year ended June 30 last the Middelburg Steam Coal and Coke Co., Ltd., reports a net profit of £11,700, against £12,990 for 1917-18. A final dividend of $3\frac{3}{4}$ per cent. is recommended, making $7\frac{1}{2}$ per cent. for the year, the same as for the previous period, and after allowing for the preference distribution there will be about £1,600 to be carried forward, against £3,700 brought in. It is believed that the current year's working will show a substantial improvement.

MINE SURFACE OFFICIALS' ASSOCIATION ANNUAL MEETING.

Presidential Review of the Year.

The first annual meeting of the Surface Officials' Association was held last Saturday night. The President, in a review of the year, showed the good work done by the Association. Substantial monetary compensation had been gained for members, who had felt unfairly treated, and redress had been obtained where loss of status or privileges had been suffered. They had attained some success regarding more liberal War bonuses and had asked for a scale of rates of pay and leave on a more generous and uniform scale. They were still endeavouring to get a lump sum gratuity for those officials who received no bonus during the past three or four years. He was sanguine that the result of their representations regarding leave and pay schedules would be greatly beneficial to the members. Although at the outset of their career they encountered opposition from certain branches of trade unionism, they had by means of conferences and interviews and plain statements of their aims and policy contrived to arrive at an amicable *modus vivendi* and had already reached a point where they were thoroughly recognised and respected as an organisation of considerable standing and importance. With the idea of unifying the many small bodies of officials that had separate associations of their own, they had held conferences with assayers, compound managers, draughtsmen, and other associations, but the smaller bodies had felt it preferable to maintain their own identities. In June the membership of the association stood at 736, and the number of branches was 35. To-day there was a roll of approximately 1,700 and branches were established at 62 centres. Every mine along the Reef was linked up with the association, and there were individual members in outlying districts as far afield as Pilgrims Rest and Witbank. The association was in no way out for gain; its motto, "*Honestas et acquitas*," reflected the spirit which pervaded its membership. Their policy of combating any form of intimidation and avoiding threats and drastic methods in their negotiations had, in the eyes of the great majority of their members, been responsible for the status to which the association had already attained, and it was a matter for considerable congratulation that their relations with the Chamber of Mines and other corporate bodies had consistently been of the most amicable nature. He confidently looked forward to that policy of moderation and reasonableness being continued, and, that being so, he foresaw a future of importance and usefulness before the association which could not fail to ameliorate existing hardships and improve the working conditions of members generally. The report, balance sheet and a new constitution were adopted.

THE TIN, COPPER AND LEAD OUTLOOK.

In their fortnightly metal report, dated December 2, Messrs. H. Bath & Sons write, *inter alia*:—Firmness has characterised the metal markets in the main during the past fortnight, although labour troubles, Continental politics and financial questions have all been hindering the development of trade. A settled state of affairs appears to be as far off as ever. Our forecast regarding the relative values of refined and standard copper has been fully borne out during the fortnight. The high premiums on refined have been reduced in the case of electrolytic by about £5 10s., in wirebars by about £7 and in best select by about £5 per ton, and it seems probable that this movement will continue a little further. The official quotations for refined copper are now as follow: Electrolytic, £105 to £107; wirebars, £105 to £107; best select, £104 to £105; manufactured, £147. Tin: At the commencement of the fortnight for a few days a little hesitation was seen in this market followed at first by a rapid advance and later by steady daily rises until the 28th ulto.; when £296 and £298 were paid respectively for cash and three months, the long foretold price of £300 per ton being very nearly reached. Yesterday, however, saw a slight set back, the market closing at £295 to £295 5s. cash and £296 15s. to £297 three months. The market has a tired appearance, which is not surprising after the big advance that has taken place during the fortnight, coming on top of an advance in the previous fortnight of nearly £12, making a total rise of about £24 a ton since the beginning of November. The demand from consumers would appear to be genuine and on a larger scale than ever and production will have to increase in order to cope with it. The latest quotation from the east is at the parity of about £300 and fairly extensive sales have been advised during the fortnight. Lead: Heavy trading has been the feature of this market, with prices marking a regular advance with the exception of a temporary reaction on the 25th and 26th ulto., amounting in all to about 12s. 6d. a ton, which has since been much more than recovered. The official closing prices yesterday were £38 to £38 5s., a total appreciation during the fortnight of approximately £4 per ton. Consumers and speculators buy freely and most of the selling appears to come from profit takers. We have no reason to alter our opinion so strongly expressed in our reports for some time, and although the advance in the last fortnight has gone rather more quickly than we anticipated it has failed to develop any weakness in the market. Rising prices must be faced for some months to come. A rumour has been current that the long standing dispute at the Broken Hill Mines has at last been settled, but there is no official confirmation of this yet. Even if happily true and it is possible to resume work without delay, it is estimated that it will be three or four months before any material relief will be afforded thereby to the critical situation that has arisen here in regard to supplies.

CORRESPONDENCE AND DISCUSSION.

Spencer Bay Diamonds.

To the Editor, *S.A. Mining and Engineering Journal.*

Sir,—I shall be pleased if you will kindly insert the following information in connection with the above company: The Machine Fabrick are building four new pulsating machines, which should be ready in about a couple of weeks. They are also building about 20 trommel sieve machines. Most of the material required for the starting of the work has already been purchased and sent on to Luderitzbucht. The framework of the building is being built at Luderitzbucht. Everything should be ready to commence operations early in the New Year.—Yours, etc.,

J. S. RICHARDSON,
Secretary.

Johannesburg,
December 23rd, 1919.

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THE WEEK IN THE SHAREMARKET.

Another Holiday Time—Tone Better on Strike Settlement—Improving Outlook.

THE market opened firmer and brighter on Monday after the Christmas holidays. The present week is also merely half a working one, and there is a tendency to put off business till the New Year is in. The fact that the Simmer Deep strike was settled at Christmas and that the Capetown trouble fizzled out were reflected in business, and the whole tone and tendency are more confident. Gold stocks are firm, diamond syndicates steady and tins better. Zaaiplaats enjoyed a small spurt. Frank Smiths are in increasing demand. The new Silver Leads allotments were unofficially quoted at 52s. 6d. with options, and it is expected that allotments will be known early next week. On Tuesday the market was slightly easier in the absence of further London cables, but many of the gilt-edged gold shares like New Modders, States and Modder Deeps advanced. The market remained firm but quiet during the day, in view of the approach of the New Year holidays.

On Wednesday the market kept firm, though in view of the holidays till Monday no great amount of business was done. New Modders, Van Ryn Deeps, Anglo-Americans and the associated companies, notably Springs, were better, and there was little disposition to sell tins, and diamonds were quiet, though prices remained firm. The return to the Rand of several leaders of the industry and the probable improvement in the native labour supply owing to the drought in the native territories, are regarded as favourable factors for the opening of the year.

	Wed., 24th.	Mon., 29th.	Tues., 30th.	Wed., 31st.
African Farms	15 6*	15 9*	16 3	16 3*
Anglo-American Corporation	56 0*	58 3	60 6	61 0
Apex Mines	7 6*	7 9*	7 9*	7 9*
Aurora Wests	—	—	8 0†	—
Bantjes Consolidated	4 4*	4 3*	4 6*	5 0*
Blaauwbosch Diamonds	—	77 6†	—	72 0*
Brakpan Mines	70 6*	72 0*	—	—
Breyten Collieries	—	12 6†	—	9 0*
Brick and Potteries	—	—	5 0*	–
Bushveld Tins	2 2*	2 4*	2 6†	2 4
Cassel Coals	30 0*	30 0*	30 0*	30 6*
Cinderella Consolidated	7 6†	6 9*	7 6†	—
City and Suburbans	7 9*	7 9*	7 10*	8 3
City Deeps	—	–	66 0†	66 6†
Clydesdale Collieries	28 9*	28 9*	28 9*	29 0*
Consolidated Investments	30 0*	30 0*	30 0	30 0*
Consolidated Langlaagtes	—	24 6	24 3*	24 3*
Consolidated Main Reefs	14 0	15 0	14 9	14 6*
Consolidated Mines Selections	33 0	33 0†	33 0†	—
Coronation Collieries	—	—	71 0†	—
Coronation Freeholds	2 5	2 4*	2 3	2 3*
Coronation Syndicates	16 0*	17 0	19 0†	19 0†
Crown Diamonds	12 6	12 6	12 6	12 9†
Crown Mines	70 6	70 0*	71 0†	70 0
Daggafontein Mines	18 9*	19 6	19 9	20 0*
East Rand Coals	2 8*	2 10†	2 7*	2 7*
East Rand Deeps	1 4†	1 3*	1 3*	1 3*
East Rand Proprietary	11 6	11 6	11 6*	11 3
East Rand Debentures	£70*	£70*	£70*	—
Eastern Golds	1 3*	1 3*	1 3*	1 5*
Frank Smith Diamonds	11 3	11 11	11 6	11 4
Geduld Proprietary	57 6*	58 0*	58 6	58 9*
General Minings	10 0†	10 0†	10 0†	10 0†
Glencoe Collieries	—		-	5 3*
Glynn's Lydenburgs	17 6*	19 0†	19 0†	18 6
Government Areas	100 0*	100 0*	102 6	103 6
Hume Pipes	22 0*	22 0*	23 6†	22 0*
Johannesburg Board of Executors	35 0*	—	35 0*	35 9*
Jupiters	6 9*	6 6*	6 7*	6 9*
Klerksdorp Proprietary	2 2*	2 1	2 1*	2 0*
Knight Centrals	7 0	7 0*	7 0	7 0*
Knights Deeps	—	—	—	9 0*
Lace Proprietary	18 6*	18 6	18 0*	18 3*
Leeuwpoort Tins	30 0	32 0	31 0	30 6
Luipaardsvlei Estates	—	—	—	7 3†
Lydenburg Farms	8 6*	—	8 1*	8 6
Middelvlei Estates	2 1*	2 6	2 4*	2 1
Modder B.'s	182 0	184 0	183 6	184 0
Modder Deeps	54 0	55 0	55 6	55 9
Modder Easts	30 0	29 9	29 9	29 9
Do. Options (3 years)	9 10½	10 0	10 0	9 9
Do. Options (4 years)	11 6	11 0	12 0	12 0
Natal Navigation Collieries	—	—	28 6*	28 0*
National Banks	—	£14⅞†	£14⅞†	£14⅞†
New Boksburgs	2 0*	—	2 0*	2 0*
New States	29 6	29 9	29 6*	29 3*
New Eland Diamonds	83 0*	86 6	85 0	85 0
New Era Consolidateds	12 6	12 6	12 4*	12 3*
New Geduld Deeps	2 4*	2 4*	2 3*	2 4*
New Heriots	9 6*	9 6*	9 6*	8 6*
New Kleinfonteins	13 0*	14 3	13 9	13 3*
New Modderfonteins	£34A	£34A	£35A	£34⅞
New Unifieds	—	5 9*	6 6†	6 6†
Nigels	6 6*	6 6*	—	6 6*
Nourse Mines	14 0*	15 9	—	—
Pretoria Cements	100 0	100 0	100 0	100 0*
Princess Estates	3 0*	3 0*	3 0*	3 0
Rand Collieries	—	3 0*	3 11*	3 9*
Rand Mines	—	—	—	77 6*
Rand Nucleus	2 1*	2 1*	2 1*	2 0*
Rand Selection Corporations	102 6*	107 0	110 0	112 6
Randfontein Deeps	5 6*	5 9*	5 9*	5 9*
Randfontein Estates	24 6*	25 6	25 10½	26 0
Roberts Victors	16 0	20 0	20 0*	21 0
Rooibergs	8 3*	8 7*	8 10	9 0*
Roodepoort Uniteds	5 0*	—	5 0*	5 0*
Ryan Nigels	4 2*	—	4 2*	4 3*
Rouxville	24 9	24 6	24 3*	24 0*
S.A. Alkalis	25 6	25 9	26 0	25 0
Shebas	2 8*	2 9*	2 9*	3 0
Simmer and Jacks	7 6*	7 6*	7 6*	7 6*
Steyn Estates	5 6*	—	—	—
Simmer Deeps	3 4	3 6*	3 6*	3 6
S.A Breweries	47 6*	50 0	47 6*	50 0†
S.A. Lands	6 7	6 7*	6 7	6 7*
South Van Ryns	8 9*	8 9	8 9*	8 9
Springs Mines	54 6*	56 0	56 0	55 9
Sub Nigels	20 0*	20 0	20 0	20 6†
Transvaal Lands	30 0†	30 0†	30 0†	—
Tweefontein Collieries	25 0*	—	—	—
Transvaal Gold Mining Estates	—	—	17 0	18 0
Union 5 per cent.	£103½	£103½	£103¼*	£103¼
Victory Monarch	39 0*	39 6*	40 0†	—
Van Ryn Deeps	105 6	105 9*	105 0*	105 0*
Village Deeps	16 0*	17 8	16 9*	16 9*
Village Main Reefs	—	—	8 6†	—
Van Dyks	3 0*	3 0*	3 0*	3 0*
West Rand Consolidateds	7 6*	7 0*	7 6†	7 9†
Western Rand Estates	8 10	8 6*	9 0	9 0
Witwatersrand	20 0†	18 6	19 0*	19 0*
Witwatersrand Deeps	—	10 0	10 6*	10 6
West Springs	23 3	23 3	23 6	24 6
Options	8 3	8 3*	8 3	8 3
Wolhuters	—	5 3*	5 3*	5 6
Zaaiplaats Tins	11 9*	13 6	12 6	11 9

*Buyers. †Sellers. AOdd lots. BEx London.

Death of Sir John Jackson.

News has just been received by cable of the sudden death on Sunday last of the well-known contractor and engineer, Sir John Jackson, in his 68th year. Sir John Jackson, C.V.O., LL.D. (Edin.), was the founder and governing director of the firm of Sir John Jackson, Ltd. He and his firm have carried out many works of supreme importance in various parts of the world, which have cost in the aggregate several tens of millions of pounds. Among the works carried out by him were the foundations for the Tower Bridge London, seven miles of the Manchester Ship Canal, the Tyne Breakwater, Harbour Works of Burntisland, Barry Dry Dock, the Arica-La Paz Railway, crossing the Andes at an altitude of about 14,000 feet; Loch Leven Water Power Dam and Pipe Line, Prince of Wales Pier, Dover Harbour, Methil Dock, and, for the British Government, the Keyham Dockyard, Devonport, the Singapore Harbour, and, of special interest to South Africans, the Simon's Town Harbour. At the time of the outbreak of the War his firm had in hand many important works, including the extensive Irrigation Works of Mesopotamia for the Turkish Government, and during the War he carried out at high pressure large undertakings for the British Government. Two members of the firm arrived in Capetown recently to look into certain important works in South Africa.

TRANSVAAL ALLUVIAL DIAMOND RETURNS IN NOVEMBER.

The latest returns from the Transvaal alluvial diamond diggings, *i.e.*, those for November, are as follows:—

	Farm.	Carats.	Value.
61	Blesbokfontein	1,420¾	£25,620
130	Bloemhot	394¼	7,145
90	Baviaanskrantz	3	28
23	Biesjeslaagte	2	16
171	Bloemheuvel	77¾	1,720
150	Cyfergat	50½	1,270
79	Cawoodshope	5¾	80
	Christiana	64¼	935
	Driekoppies	7½	151
153	Doornbult	10½	246
245	Dievedraai	140¾	2,466
131	Diamontdoorns	12¼	75
290	Eerstebegin	48¼	1,626
593	Eastleigh	56¼	986
333	Grootdoorns	29¼	573
125	Grootpoort	3	26
78	Goede Hoop	13¼	218
318	Goudplaats	155	4,425
142	Hollaway's Rust	30¾	329
12	Italie	57¼	2,332
137	Kareepan	519¼	10,947
104	Klipkuil	40¾	829
108	Kromellenboog	4¼	35
108	Kromellenboog	4¼	34
	Koppieskraal	2	60
54	Koppiesvlei	4¼	34
142	Kameelkuil	1,493¾	26,313
33	London	218	3,122
143	Leeuwfontein	269¼	5,405
326	Middelbosch	9¼	111
120	Marietjesfontein	2¾	46
256	Matjesspruit	2¾	24
75	Mimosa	4¾	84
128	Mooifontein	78¾	1,183
101	Nooitgedacht	1¾	28
121	Plessisdam	303¼	4,465
121	Panfontein	3¼	32
138	Rietkuil	1,635½	26,765
120	Rietput	1¾	29
129	Rondevlei	2½	20
42	Rietkoppies	5¾	55
25	Sandringham	6¼	105
	Schweizer Reneke	122	2,159
10	Schaapplaats	2¾	46
	Schaapboschesdraai	16½	169
329	Vechtvallei	32¾	571
52	Welgevonden	38¼	487
165	Zevenfontein	2¼	30
68	Zwartlaagte	229¾	4,566
106	Kameelfontein	749	4,751
520	Beynestpoort	735	4,020
314	Roodeplaats	112	874
426	Franspoort	149	305
402	Kaalfontein	75	288
501	Rietfontein	93	285
209	Rooikoppies	9	24
	Van Ryn Deep, Ltd., Benoni	4	25
	Totals	9,570	£148,689

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TIN SAVING: SUCCESSFUL NEW TREATMENT.

Important Discovery—Good News for Producers.

It may be remembered that, at the meeting of Tehidy Minerals, Ltd., on August 28 last, Mr. C. A. Moreing (of the firm of Messrs. Bewick, Moreing & Co.), speaking with reference to tin extraction, said: "We have for a long time now been carrying out extensive research work at East Pool & Agar, with the object of improving tin extraction, and I think I may safely say to-day that we see our way now to very remarkable improvements. So far, our research work has been conducted on a laboratory scale, and the latest results obtained show an extraction by our new methods of 93 per cent. We are now engaged in erecting a unit on a commercial working scale at East Pool, which we have every reason to hope will give similar results to those obtained in the laboratory." Coming from Mr. Moreing, great importance was attached to this statement, for it was remembered that about the year 1905, a period of rapid metallurgical progress commenced in the Broken Hill district in which his firm took part in connection with the formation of the now highly successful Zinc Corporation. This progress resulted in a very substantial improvement in the recovery of lead, zinc, and silver—in fact, this was so pronounced that the management was able to treat the formerly worthless tailings from the older process at a satisfactory profit. The lead recovery of the mill at Broken Hill now approaches 90 per cent., whereas, before 1905, it was little more than half that figure. Bearing in mind what his firm had done in connection with Zinc Corporation, the curiosity and interest then created have not in the least degree subsided; indeed, they have been increased, as rumours were current from time to time of a discovery in the Tolvaddon Laboratory of East Pool, where, during many months, experiments had been conducted with a diligence and research worthy of all praise, and, be it added, of the success now actually achieved.

On November 21 the whole secret of the new treatment was revealed to a select company of mining gentlemen at East Pool mine, in the presence of Mr. C. A. Moreing, Mr. M. T. Taylor (the East Pool manager), and of Mr. Partington, its chief metallurgist and chemist. The two last-named gentlemen have had the matter specially in hand, and to them Mr. Moreing gives the credit of a discovery that is likely to revolutionise the prospects of tin mining, not merely in Cornwall, but in other parts of the world. The wastage by the present system is from 30 to 40 per cent., and, could the greater part of this be prevented, it would mean that mines now struggling for existence would be on a prosperous basis, and others that have been closed down could be re-opened, with every prospect of being profitably worked. To prevent this loss in extraction, many efforts have been made in the past, but with only microscopic results. At East Pool, however, Mr. Taylor and Mr. Partington, in co-operation with Mr. Arthur Richards (of the Cornwall Tailings Company) have succeeded, by laboratory tests, in getting an extraction of from 90 to 93 per cent. instead of 70 per cent., and they hope to be nearly as successful in the treatment of the ore in bulk. This result has not been arrived at without hard work involving the closest investigation. Mr. Taylor states that his staff, by earlier experiments, were able slightly to improve the extraction, though leaving them far from the goal at which they aimed. The requirements of the Government in connection with the plant delayed progress, but investigation was continued uninterruptedly.

In an interview with the *Western Morning News*, Mr. Taylor said: "We carried out a considerable amount of investigation in our laboratory at Tolvaddon, and, in the course of this work, discovered that under certain conditions we could produce a coating of metal on the tin oxide particles. Knowing from previous experience that sulphides and metal particles were amenable to flotation, we at once turned our attention in that direction. Nearly every agent in the long row of bottles in our laboratory was tested with varying degrees of success, in our endeavour to float these metallic-coated particles. For some time we were buoyed up with the hope that we had struck the right agent, and we took out patents covering the agent. We found after further investigation, however, that we could not get the desired results, because once silica has been roasted it also becomes amenable to flotation, so that any concentrates we obtained on this process would be of very low grade. This, nevertheless, did not prevent us turning our attention to the flotation of tin oxide in the unburnt feed direct from our battery. For over six months, we have carried out an enormous number of tests, and in the end we obtained an agent which, in our opinion, would float tin oxide economically."

Mr. Taylor believes that this is the first time tin oxide has been floated—at all events, they had, he said, now found how to do it commercially and economically. He does not claim that the experimental stage has yet passed, but the present result is that there is at East Pool a small unit capable of treating 20 to 25 tons of ore a day, and by this a considerably higher recovery is being obtained than was possible by the old methods. He says: "Treating about 20 to 25 tons of ore a day, and after the pulp goes through the flotation cells we find it will be necessary, in order to get a maximum extraction, to grind a middling from our tails. Therefore, only the initial flotation unit is completed, and these reground middlings have yet to be refloated before a thorough test can be made. It is, therefore, impossible to say what degree of extraction can be obtained, but even with this small incomplete unit we are getting considerably higher recovery than by the old methods of concentration. In the laboratory we have succeeded in obtaining from 90 to 93 per cent., and we hope to produce these results in our practical operations."

The small unit referred to by Mr. Taylor was inspected last week, in connection with which Holman stamps are employed; but the old method of tin treatment, involving tables, vanners, and buddles, has been reversed. Mr. Moreing is a thorough believer in the success of the process, and said so at the gathering referred to. "If (he said) the extraction was increased from 70 per cent., which was now the total possible, to 90 per cent., which was possible under the new method, it meant 16 tons of tin more a month. The production of 80 tons a month meant 960 tons a year; of 96 tons a month, 1,152 tons a year—a difference of 192 tons. At the present price of £166 a ton that represented a total of £31,872 increased profit. The saving in working costs would be at least £12,000 a year." His firm and the diligent workers on the spot are to be congratulated on their success, by which they have rendered a service to Cornish mining, the full measure of which it is impossible at this stage to assess.

New Oil Proposition.

A new company, "Geluk Oils, Limited," will shortly be on the market. The authorised capital is £50,000, in 10s. shares. The whole of the initial capital required has been underwritten privately. The farm "Geluk," which is the nearest oil shale property to the railway and town of Wakkerstroom, has been well prospected and most favourably reported upon. So far four oil shale seams have been discovered, varying from 3 to 20 feet; as the seams are all lying horizontally the work of opening them up can be done by "adit" and therefore very cheaply. The company's engineer will revisit the property early in January, when fuller information will be obtainable. Considering the immense demand for oil all the world over, this proposition looks promising. The provisional directors of the company are Mr. A. J. [illegible], Colonel Bettington, Mr. F. A. [illegible], M.E., A.I.M.M., Mr. J. H. [illegible] and Mr. H. P. [illegible]. The mineral rights over the property have been acquired by the company on very favourable terms.

A REVIEW OF THE SOUTH AFRICAN MINING AND ENGINEERING TRADE.—V.

What Happened in the War Period—Possibilities of the Market for British Goods—American Competition.

The following is the continuation of Mr. J. Wilson Goode's report on South African trade conditions:—

Cast-iron Hollow-ware.—With regard to cast-iron hollow-ware, Kaffir pots and cast-iron cooking stoves, some little progress has been made in the manufacture of these articles in South Africa and, although at present interrupted, will be resumed on a larger scale later. The demand for the imported article will, however, always be heavy as the articles made locally cannot compete except in a few items. With the exception of certain items, such as three-legged Kaffir pots, which were supplied to this market by Germany in some quantity, the United Kingdom before the War held practically a monopoly of the cast-iron trade and is expected to do so in the future; but certain patterns of stoves supplied by America since the War are likely to continue to find a market in this country.

Bolts, Nuts and Rivets.—Although the imports from the United Kingdom during 1918 were nearly double those from America, the progress made by the American products during the last few years has been more marked than in the case of the United Kingdom. It is thought, however, that when facilities are given to United Kingdom manufacturers to send larger supplies to this market they will be able to strengthen their position very considerably. In this class of manufacture the United Kingdom far excels any other country, but it will be interesting to watch the progress of Canada, who entered the trade in 1916, and has since made good progress. The total importations in 1913 were valued at £69,256, of which the United Kingdom contributed £56,669. In 1918 the total importations were valued at £77,146, of which the United Kingdom supplied £42,769, the United States of America £23,720 and Canada £10,246.

Nails and Screws.—The total imports in 1913 were valued at £71,653, of which the United Kingdom contributed £43,683, Germany £12,078, America £7,167 and Belgium £4,956. The value of the imports in 1918 was £106,178, of which Canada contributed £33,163, America £32,265 and the United Kingdom £14,424. The most striking feature of this trade is the great progress made by Canada, frim which country goods to the value of only £12 were supplied before the War. It is probable that a large share of this trade will be retained by Canada provided Canadian manufacturers pay more attention to the packing of their goods.

Cutlery.—The total importations in 1913 were valued at £104,556. The supplies from the United Kingdom were valued at £75,142, from Germany £24,039, and from the United States of America £4,338. In 1918 the total importations were valued at £219,680, of which the United Kingdom supplied £102,748, Japan £61,300, Canada £32,100 and the United States of America £17,655. In connection with the Japanese imports, which first entered this market in 1916, and rose to a high figure in 1918, they are chiefly represented by an inferior quality of cutlery used chiefly in the native trade. It is believed that had supplies from other countries been forthcoming Japanese manufacturers would not have received the slightest encouragement having regard to the exceptional inferiority of their goods, and it is not thought that they will find a market in this country so soon as adequate supplies can be drawn from other countries. Japanese manufacturers were successful in disposing of a large quantity of pocket knives for the native trade, but the low quality of the articles supplied caused great dissatisfaction.

Sewing Machines.—The imports in 1913 amounted to £68,814, of which the United Kingdom contributed goods to the value of £42,302, Germany £22,670, and the United States of America £3,706. The total importations in 1918 were valued at £125,592, of which the United Kingdom supplied goods to the value of £119,781 and the United States of America to the value of £5,471. It will thus be seen that the chief source of supply of these articles is still the United Kingdom, but in order to capture the additional trade which was formerly in the hands of German manufacturers it is considered necessary that a sewing machine of a lower quality should be manufactured in the United Kingdom as well as the high-class article which British manufacturers are accustomed to supply. Otherwise, it is not improbably that American manufacturers will capture the trade which was formerly in the hands of Germany.

Enamelware.—Particulars of the imports of this commodity will indicate the improved position of America, although the class of goods supplied by that country is considered to be inferior to the supplies from the United Kingdom. For superiority in finish, Sweden is unrivalled. As regards Japanese supplies, it is not considered likely that there will be a great demand in the near future, but it is possible that the goods supplied by America during hostilities will be improved upon when American manufacturers have to face keener competition.

Motor Cars.—American motor cars are firmly established in the South African market, and United Kingdom manufacturers will experience considerable difficulty in weakening the hold American manufacturers have secured. During the War, American supplies have been entering this country freely, and the imports of Canadian manufacturers have been well maintained, having regard to the reduction in the total number of cars imported into the country. Buyers of high grade cars are few in number, but for low and medium grade cars, ranging in price from £250 to £750, there is a good demand. The requirements of this market are best suited with a light car of ample power. The popularity of the American motor car is due to several reasons. In the first place, the width between the wheels of American cars, which is 56 inches, conforms to the track of the country. Then the American cars are so constructed as to enable them to cover the rough country over which it is so often necessary to travel and to cross shallow streams and rivers without the magneto coming into contact with water. Again, they can be driven long distances without causing the same fatigue to the driver as in the case of the British car. This is due to the fact that the American car can be driven practically all the time on top gear, and the question of fatigue caused by repeatedly changing the gear does not arise. In addition to these advantages, American cars are exported with self-starters and electric lights. On the other hand, British cars—with the exception of the higher grade makes—are invariably sent to this country without these essentials. A careful study of South African conditions and resultant requirements by British manufacturers is essential before the British motor industry can hope to find a good market in this country.

MINE DEPT. EXAMS:—RECENT RESULTS.

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TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Trading with America Upset—Commercial Exchange—Wages in the Building Trade—Electrical Goods.

THE feature of the week has been the question of trading with America, as several rumours are abroad that shipping may be much restricted from that quarter. If so that means an increase in values for the next three months at least, because if supplies are checked from America it will create a bad outlook, as British heavy goods are difficult to get, as all essential mining materials are anything but plentiful in Johannesburg. As regards America, a cable message was traced that in consequence of the strikes there and the difficulty of obtaining coal for the ships, all promises made as to definite dates for delivery must be withdrawn; also no further orders must be taken, but simply submitted per cable. All this, however, chiefly referred to heavy steel and iron goods. Another American house dealing in the less heavy goods also received a cable on Tuesday, and nothing very disturbing was hinted at as regards the trouble over shipping. A recent message from a Johannesburg merchant now in New York states that things are upset there owing to the overnight and other strikes for very little justification, therefore he is doing little or no business. Yet another American house here says it is not the trouble so much over shipping probabilities as the exchange, which on Tuesday was quoted in Johannesburg at $3·58 (14s. 11d.) for the British pound in ledger entries or paper money, and not the actual gold coin of a sovereign, which more than retains its value in America and Canada. A financial expert thinks that now the pound has fallen below 15s. on the American exchange, the great probability is that it will soon improve, because America will have to do something to preserve its export trade, therefore any international loan will be welcomed to assist the exchange to become more normal as between America and Europe. The check in business with overseas has assisted our engineering shops and foundries, as the mines are determined to go ahead through the gold premium, and naturally they do not wish to lose the market. What the mines are doing is to get all kinds of construction plant renewed by transferring the best parts of one machine to another. Many parts are worn out or missing which the engineering shops are making good. Take, for example, the Modder East, which has leased the Apex battery, and it is obvious that something will have to be done to put it in first-class working order again, and who can do it but the engineers and foundrymen? What applies in this case is on all fours with almost all the properties throughout the Rand, as all the old machinery must be refitted, as it is practically impossible to obtain any essential from oversea at present.

THE COMMERCIAL EXCHANGE.

Business was quite good on Tuesday, when bookings were made for the January account. The special features were the large indents from the Belgian Congo and the Rhodesian railways. One line alone from the Congo was for 1,500 sheets each of corrugated iron of 24 gauge in all lengths of 6, 7, 8, 9 and 10 feet, making a total of 7,500 sheets. All the quotations were free on rail in Johannesburg and payment by cheques on a Johannesburg bank. Our railways as well as the Government P.W.D. department are purchasing largely for the new year, also the various municipalities. The mines are still on the saving side, but after the stocktaking for December is completed, it is anticipated that even the mines will wake up and come into the market with a little more earnestness. No one knows better than the buyers that values are on the rise, therefore replenishment must take place, as much of the War reserves are partially or wholly absorbed. The following are a few of the ruling prices: Shovels, 65s. to 70s. per doz.; wheelbarrows, 55s. to 60s. each, very scarce indeed; imported mild steel advancing, being 37s. 6d. and upwards per 100 lbs.; tool and drill steel, 7½d. per lb.; steel plates in the smaller sizes very scarce, and 80s. has been paid for 1-16, ⅛ 60s., ¼ 50s., and larger thicknesses 45s.; ½ and ¾ in. galvanised piping, 20 per cent. up; galvanised roofing iron, 1s. 5d. to 1s. 7d. per ft., according to length; second-hand rails, from 14 to 24 lbs., £20 to £25 per ton, according to quality. A gyratory crusher was offered at £500, originally costing £1,500.

TIMBER AND BUILDING REQUIREMENTS.

There is no alteration in prices, but if anything an easier tendency in deals. The values are for deals, 1s. 9d. to 2s., according to length; floorings, 9½d. to 10d.; and ceilings, 6½d. to 6¾d.; scantlings, 1s. 8d. to 1s. 9d.; roofing iron, 1s. 5d. to 1s. 7d. Very little second-hand timber or iron available, also a poor outlook for immediate supplies. There are many contracts to be tendered for. However the increase of 6d. per hour in the building artisans' wages may delay some of them, but as a general statement there will be more than sufficient put out to employ all the artisans available and the building materials. The price of white lead is 90s. to 95s. per 100 lbs., and the retail price for genuine is 1s. to 1s. 3d. per lb. Linseed oil, 70s. for 4 galls, Imperial drums. There is a shortage of plate glass and in a lesser degree window glass. The English supplies in the immediate future are very problematical as, according to the latest advices, the demand from the Continent is very great indeed.

BUILDING TRADE WAGES.

In consequence of the higher cost of living it has been provisionally arranged that the members of the different trades connected with the building operations are to have their wages raised from 3s. 6d. to 4s. an hour on a 44-hours' week. If the formal acceptances of the offer by the different Unions are acknowledged the new arrangement will commence from February 21st. This is eminently satisfactory, especially as at the commencement of 1919 a rather long-drawn-out strike amongst the building trades occurred. Thanks to the round table conferences and meetings of masters and men, labour seems much more happy from an agreement point of view than during the better part of 1919. In addition to this increase, a special committee is now engaged to formulate a scheme to provide for a "Holiday Fund." This has now and again been recommended in these notes, and it will be interesting to hear the result of the conference. Another important matter is in connection with painters, as between the full-fledged artisan and those who have picked the trade up as they went along. In the latter category there are many competent men who have through years of practical service made themselves efficient. To meet these a registration scheme under a joint board will be established both for the efficients and those having served an apprenticeship, which will take effect from January 9th, for all painters registering their names with the

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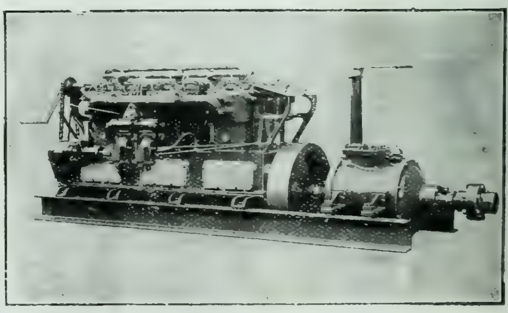

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ELECTRICAL MARKET.

The electrical business has been of a fair average quantity for the month of December, but a falling off naturally takes place about Christmas time. On the Commercial Exchange country business has been fairly good, in fact quite an average month. Tubing and wiring are coming in plentifully. Ceiling roses are still practically non-existent, and adaptors are also very scarce. Lamp holders are on the short side and prices are very high indeed. Lamps remain much about the same price, but as they cannot be replaced at Home at anything like the price at which they are now being sold in Johannesburg, a rise in these is inevitable. As a matter of fact, lamps are now being sold here at a much lower price than at present ruling in England and Holland.

Barrett Gold.

Another effort is to be made to revivify this old Barberton concern, which paid small dividends about 20 years ago. Last year £11,321 worth of gold was recovered from 35,762 tons treated, equivalent to 1½ dwts. per ton, but recent monthly returns have been very poor and the losses considerable. It has, therefore, been decided to close down until sufficient capital is provided to thoroughly prove the rest of the ground. At February 28 last there was a debit balance at profit and loss account of £17,865. Two suggestions are being put forward for raising further funds, the amount required being at least £20,000. The directors suggest an issue of either cumulative 10 per cent. participating preference shares, or of 7 per cent. debentures, but the former method is preferred. A loan of £5,500 was recently arranged, which enabled an overdraft at the bank to be liquidated, but there are still loans made by the directors outstanding.

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NOTICE IS HEREBY GIVEN that the Sixteenth Ordinary General Meeting of Shareholders in the above Syndicate will be held in the Board Room, Consolidated Gold Fields Buildings, Simmonds Street, Johannesburg, on FRIDAY, JANUARY 30th, 1920, at 11 o'clock in the forenoon, for the following purposes:

1. To receive the reports of the Directors and Auditors, and to consider the Balance Sheet at December 31st, 1919, and Statement of Income and Expenditure from January 1st, 1919, to December 31st, 1919.
2. To elect Directors in the place of Messrs. D. Christopherson, C.B.E., Sir E. H. Dunning, J. Friedlander, H. Newhouse, W. S. Smits, and Lieut.-Colonel F. Leslie Brown, D.S.O., who retire from office in accordance with the provisions of the Articles of Association, but are eligible and offer themselves for re-election.
3. To elect Auditors for the ensuing year, and to fix the remuneration for the past year's audit.
4. To transact such other business as may be transacted at an Ordinary General Meeting.

The Transfer Books of the Syndicate will be closed from January 23rd to [illegible], both days inclusive.

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The West End Property.

We understand that boring operations on the West End diamond property in the Kimberley district have up to date indicated the existence of a diamondiferous area something like 500 claims in extent. Further developments on this property, with which important interests are associated, are understood to be pending.

* * * *

Leeuwpoort Tins.

With tin at a record price, and development at the mine in a position of unexampled strength, the Leeuwpoort people have every reason to congratulate themselves. Some fears are, however, expressed that the company may be merged in the S.A. Townships, Mining and Finance Corporation; and this is supposed to be the cause of the price of the shares failing to respond to the high and increasing price of the product. Mr. Julius Jeppe, however, has issued a denial of the absorption rumour.

* * * *

The Simmer Deep Decision.

The Board of Reference in the Simmer Deep case has found that the mine captain who engaged the timberman over whom the dispute arose knew at the time of the engagement that the man was a German. In accordance with the agreement arrived at, therefore, the man in question has been confirmed in his job underground. The Board of Reference was constituted by Messrs. Buckle and McFie, and the incident may now, therefore, be regarded as closed.

* * * *

Majunga Oilfields of Madagascar.

The prospectus of the Majunga Oilfields of Madagascar has appeared in London offering 50,000 ordinary shares of £1 each at par, part of an authorised capital of £200,000. The directors include Mr. John Martin, the alleged discoverer of the oilfields, who has had thirty years' experience of boring in oil properties, and who states: "This property is probably the largest and will prove to be the richest oilfield in the world." Mr. Martin proceeds to Madagascar in a few weeks.

* * * *

How South Africa Loses Capital.

Mr. Solly Joel having become extensively interested in the Lancashire cotton industry, has now acquired the Speyer interest in London "tubes." The effect of the double income tax is well exemplified in these acquisitions. Doubtless Mr. Solly Joel has made these colossal investments in Home industries with a view to saving the payment of taxation in two countries. The capital involved in these purchases might well have found its way into South African industries had it not been for the double income tax, and it is therefore clear that the incidence of this form of taxation is most injurious to the financing of South African industries.

* * * *

Forthcoming Mining Exhibition at Johannesburg.

The sequence of annual mining exhibitions held by the Chemical, Metallurgical and Mining Society of South Africa was broken by the War. It is now intended to resume them, though the next one, to be held at the School of Mines from 21st to 31st January, 1920, will be necessarily on a smaller scale than its predecessors. It is intended, therefore, that the Exhibition shall be primarily for (1) exhibiting the many devices and materials manufactured locally for the mines during the War, as substitutes in place of supplies usually imported; (2) other devices and apparatus used on the surface and underground; (3) a comprehensive exhibit of "Safety First" devices; (4) crude and manufactured mineral products; and (5) diagrams, models, etc., of mines, works, plants, apparatus, etc., of recent date, or connected with the early history of the Transvaal mines. No charge will be made for exhibits shown by Mines or mine employees. A full description of the exhibits of interest to engineers will appear in our next issue.

A Mysterious Industrial.

An industrial share known as "A[illegible] cement" was introduced on the Stock Exchange this week, with a preliminary 'boost' in the advertising columns of *The Star*. The notice says that the shares have been introduced on the Stock Exchange in order to render purchasers propagandists of this new industry. No mention is made, however, of the number of shares being placed on the market, obviously a matter of the first importance to those who buy the shares at the high premium at which they were introduced. In this connection, we may draw attention to the plea set forth in our leading columns for Stock Exchange reform in the direction of making new ventures advertise all the essential particulars of their flotation.

* * * *

Modder West Gold Mine.

The development on the Modder West Gold Mining Company's property on the East Rand having disclosed a reef which cannot be definitely correlated with any of the reefs at present being worked by the Far East Rand gold mining companies, the directors of Modder West have issued an invitation to geologists, stratigraphists and pressmen to visit the property and inspect the workings. There are several theories to account for the reef body disclosed, and the view of Mr. Rose-Martin, consulting engineer and general manager of the company, is to the effect that he has "opened up what promises to be a new and exceedingly payable Rand"! The inspection will take place next Sunday morning (January 11) and any persons interested are invited to be present.

* * * *

The Abercorn.

The Abercorn G.M. Co., Ltd., is a new flotation with a registered capital of £25,000, a subscribed capital of £20,000, and 5,000 shares of 20s. each are held in reserve. This company has been formed and has taken over the Abercorn Mine in the Gwanda district, for many years run with success by Mr. W. J. Lane. Messrs. H. Durrell and Dold, of Bulawayo and Johannesburg respectively, made very satisfactory reports, and the property was purchased outright for £15,000. Messrs. J. Clack & Co., of Bulawayo, are supplying and erecting the whole of the plant, and erecting will be in progress by the end of the year. The directors are Colin Lawrence, Esq. (Mayor of Kimberley), and J. W. P. Clack, of Bulawayo. Secretary, E. J. Davies, Bulawayo.

* * * *

A Second Kimberley?

About one hundred and twenty miles west of Kimberley in the dry Griqualand West country there is being opened up a group of diamond prospects that holds out promise of proving a second Kimberley. These prospects are in the hands of several Rand financiers, and the data already obtained from the several workings have so stirred the imagination of those interested that no difficulty will be experienced in raising all the money needed thoroughly to test the value of the discoveries. Among the mines in the district may be mentioned the Makganyene, the West End, the Postmasberg, the old Peiser, and several lesser diamondiferous occurrences. In our next issue we hope to give a map of the district, from which will be seen the possibility of proving a veritable nest of new diamond mines of varying values and importance, constituting, it may be, another Kimberley!

* * * *

Imperial Mineral Resources Bureau.

Sir Richard Redmayne, the well-known authority on mining matters, interviewed in reference to the work of the Imperial Mineral Resources Bureau (of which Sir Richard Redmayne is chairman), pointed out the immense amount of valuable work done throughout the Empire since the composition of the Bureau was completed in July, 1918. The Bureau was engaged on an extensive statistical classification of the Empire's mineral resources through the medium of 16 technical committees, comprising some of the best known mining and metallurgical experts of the Empire. With a view to establishing a still closer connection the Bureau suggested that all parts of the Empire should appoint a qualified representative to act as a corresponding member. Sir Richard Redmayne mentioned as an unqualified success the experiment adopted in South Africa and India of sending a technical representative to the United Kingdom to keep in close touch with the Bureau. The experiment had been of reciprocal advantage.

* * * *

The Outlook for Silver.

The outlook for silver, according to the latest advices, continues to be most favourable. It is believed that the Chinese demand, usually brisk in the late autumn, ought now to be nearly satisfied, and that consequently not much more should be purchased for the customary requirements of the Chinese New Year, which falls on February 20, 1920. Yet, in face of the unparalleled hoarding of silver in China, it is not wise to build too much on this assumption. Yet, even without China, there would be still a very great demand for silver. Most of the European nations are wanting it for currency purposes, and, if the premium on gold continues to mount up, India may again appear as a large purchaser. Holland, as already noted, finds it necessary to reduce the proportion of silver in her coins from 945 per 1,000 to 800 per 1,000. On the other hand, Spain holds a large quantity of silver, which she might be induced to sell at the present high level. The bulk of the factors seem, however, to discountenance any great fall in the prevailing high price.

* * * *

Bwana M'Kubwa Copper.

The report of the Bwana M'Kubwa Copper Mining Company for the year ended 30th June last states that the authorised capital of the company is £600,000, in 1,200,000 shares of 10s. each, of which 925,023 shares have been issued and 150,000 are under option at par, leaving 124,977 shares in reserve. The balance of concentrates on hand at the mine at the date of last report have since been shipped and realised. The erection of the minerals separation test plant has been completed and the trial tests are now in progress. The results for 37 days' run are as follow:—2,394 tons of ore, assaying 5·61 per cent., were treated, yielding 404 tons of concentrates, assaying 26 per cent. copper, the recovery being 78·91 per cent. of the copper contents of the ore. Final figures cannot be obtained until the trial tests are completed, but Minerals Separation, Ltd., and the company's officials at the mine agree that the results obtained so far confirm the claims made on behalf of this method of concentration of these ores. The work at the mine has been confined chiefly to mining the ore required for Minerals Separation, Ltd.'s, experimental trial run.

* * * *

Luipaardsvlei Estate.

The Luipaardsvlei report to June 30 last states that the result for the year is a loss of £5,316, and after writing £7,117 for depreciation, the credit balance of £114,517 brought in was reduced to £102,084, which the directors recommend be carried forward. This balance is largely represented by the additions which over a number of years have been made to the general equipment of the mine, and to the property, and to that extent is not in a liquid form. Deails of the year's operations are as follows: 244,120 tons of ore were crushed, being at the rate of 12·18 tons per stamp per working day. The average grade of ore sent to the mill was 5·207 dwts. per ton, and the total recovery was 94·13 per cent. of the gold contents. The yield from all sources was £1 0s. 5·906d. per ton crushed. The average working expenditure was £1 1s. 3·593d. per ton crushed, which includes a charge for development redemption of 3s. per ton on the tonnage crushed. The company's contribution to the miners' phthisis funds and pay to dependents of men at the front, etc., have been included in the working expenditure. The payable ore reserves at June 30 last were as follows: Fully developed, 713,870 milling tons of an average assay value of 5·32 dwts. per ton; partially developed, 57,879 milling tons of an average assay value of 5·94 dwts. per ton.

TOPICS OF THE WEEK.

TRANSPORT AND RAILWAY QUESTIONS.

Sir William Hoy's annual report on the South African Railways has long ceased to be a mere record and review of railway matters during the year. True, it does admirably fulfil the functions of an annual record and review of railway affairs, but, more than that, it reflects the whole trend of the industrial progress of the country, and includes a wealth of detail to be found in no other Government publication. Transport questions are, of course, closely allied with mining, and we would like to have space to reprint whole sections of Sir William Hoy's report which have a very intimate bearing on the mining, engineering and economic development of the Union. A few of the salient points from the report must, however, suffice this week. During the year under review (ending on March 31, 1919) new records were established in almost every department of railway activity, and this in spite of the severe temporary setback occasioned by the epidemic. Nearly 51½ million passengers were carried; over 14 million tons of revenue-earning goods and coal were transported; the mileage of line worked (including the 1,419 miles in the South-West Protectorate) totalled 11,478. The total capital expenditure at the end of the year since the inception of the railway system had amounted to £94,331,000, and the year's earnings reached the unprecedented figure of £15,282,279. At the end of December last the railway earnings had reached a total of about £13,800,000, and we may expect that by March 31 next the figure will be in the neighbourhood of £19,000,000. While railway earnings have been leaping up with the assistance of increased rates, which seem to have had no retarding influence upon the quantities of goods carried, expenditure has advanced with still more rapid strides. The gross working expenditure in 1918-19 stood at £11,680,000 or £863,000 more than the previous year, and the gross profit (£3,601,000) fell short of the amount required for full interest payment by about £900,000. It is perhaps worth recording that, if expenditure entailed in connection with the epidemic, the increased wage rates, the reduced hours of duty, the enhanced cost of materials and the increased War bonus payments were eliminated from the balance sheet as representing unforeseen, though of course absolutely necessary emergencies, the Administration would have been able to show a surplus of probably two millions sterling after paying full interest charges. The steady increase in wage rates since Union has, of course, thrown enormous burdens upon the Administration. Since 1911-12 the total increase in the wage sheet has been £4,151,000, and now that the eight-hour day system, of which, it may be mentioned, Sir William Hoy expresses his general approval, is very nearly in full operation throughout the Union, the expenditure account is likely to rise rapidly, while capital expenditure on no inconsiderable scale will be a necessary consequence of the new system. "South Africa," Sir William Hoy points out, "has illimitable resources, but if they cannot be turned into marketable commodities at ruling rates, they will remain undeveloped and the labour market will be restricted. If progress and prosperity are to be assured in the trade competition that must inevitably ensue, this cannot be done by following, without modification, precedents set by countries whose labour conditions differ from our own. Pioneer work cannot be conducted in this way." On the whole, and despite all that has been said and written of the shortcomings of the S.A.R., it must be admitted that it has come through the adverse conditions caused by the War with wonderful success. Railways everywhere throughout the British Empire have suffered in the last five years, and Sir A. Geddes, in a speech in England the other day, declared that South Africa had fared better in this respect than any other part of the Empire. Of course, new construction has been hung up; and Sir William Hoy shows that, as promised recently by Mr. Burton, a broadly-conceived plan of railway expansion is shortly about to be launched by the Government. Little reference beyond a passing mention is made to the electrification of the railways, but the reason is doubtless that the Merz report more properly falls within the current year. Sir William Hoy's report is packed with facts reflecting the progress of the transport and general industries of the country, and we hope to quote copiously from it in future issues.

A BADLY NEEDED STOCK EXCHANGE REFORM.

Since the recent boom in new flotations on the Johannesburg Stock Exchange began, it has become a matter of growing criticism that the shares of all sorts of syndicates are dealt in at premiums, by people who often know next to nothing of the undertaking in which they are speculating. It is true that members of the Stock Exchange can obtain particulars of each share quoted from the data posted, under the Stock Exchange rules, on the notice board in the Exchange. But the outsider has not access to that information, nor can he always expect his broker to go to the trouble of obtaining it for him. Several glaring cases have recently occurred of this sort, and it is high time the Stock Exchange Committee took the matter up. For our part, we endeavour each week to print particulars of each new flotation, but sometimes we find that the promoters shun, rather than court, the publicity we are anxious, in the interests of our readers, to offer them. In this connection we may point out that a new Stock Exchange regulation has just come into force in London, which is welcomed by investors of all classes. In future, before leave is given to deal in securities which are issued without any prospectus publicly advertised, or circulars to shareholders, an advertisement must be inserted in two leading financial papers, giving all necessary details relating to the formation of the company and to the flotation of the issue, and stating that the directors collectively and individually are responsible for the information advertised. These details must include statements by the chairman or secretary of the company as to:—(1) The capital, authorised and issued; (2) borrowing powers and the extent to which they have been exercised; (3) date and particulars of incorporation; (4) names and addresses of directors, bankers, auditors, and secretary; (5) objects of the company, nature of its business, or particulars of property acquired; (6) material conditions relating to: (a) the formation of the company; (b) the flotation of the issue. We strongly commend this example to the Johannesburg Stock Exchange Committee; and will welcome a ruling from it on the subject. So important is the matter, that we are quite willing to set aside free space to be devoted to giving the particulars of new ventures, as supplied; and we desire no other reward than the satisfaction of knowing that our readers are put in the way of having all the essential particulars of each new enterprise that makes a bid for their money and their favour on the Stock Exchange.

National Bank Activity.

The National Bank of South Africa has, it is understood, purchased one-half of the interest held by Barclay's Bank in the Colonial Bank. Mr. D. Cunningham, who is the London manager of the National Bank of South Africa, has joined the board of the Colonial Bank. Some months ago Barclay's Bank purchased a large holding of the Colonial Bank's shares, while for nearly two years there has been a close working agreement between the two concerns. The paid-up capital of the National Bank of South Africa is £2,965,000, and its reserve amounts to £1,050,000. The London committee of management consists of: Mr. H. B. Sim (chairman), Mr. O. R. Dunell, Mr. B. Kitzinger, Mr. H. D. Lewis, Mr. J. Macalister, Mr. G. H. Raw, and Mr. G. H. Rennie. This is the first step this bank has taken in the direction of amalgamation. The Colonial Bank has about forty branches, including those at Liverpool, Manchester, and New York. There are others in the West Indies and West Africa.

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THE YEAR WITH THE MINING INDUSTRY.

A Review of 1920 with Reference to Gold, Diamonds, Coal and Base Metals in South Africa.

II.—The Rand Dividend Distribution Analysed.

In our last issue we dealt briefly with the outstanding features of Transvaal Gold Mining during the past year. Special reference was made to the incidence of the gold premium on the profits of mines. Exact figures are not at present available as to the aggregate gain which has resulted from selling gold in the open market, nor can one at present attempt anything more than a very approximate estimate of the effect of the gold premium upon returns of individual companies. The improved dividend distributions announced at the year end, however, give some index as to the very beneficial influence which has resulted from the appreciation in price of the metal, and in this instalment of the annual review we propose to deal at some length with the recent dividend announcements of Rand gold mines. Elsewhere in this issue will be found a full and complete statement of dividends declared in respect of last year's operations.

Excluding special share distributions and liquidation dividends, etc., which amount to £845,832, the dividend total for the Witwatersrand amounts to £5,544,255, which compares with £5,330,966 for 1918. Special distributions were as under:—

Durban Roodepoort (Liquidation) ...	£121,875
Geduld (shares)	172,908
Modder Deep (shares)	157,738
Robinson (Bewaarplaatsen receipts) ...	137,500
Van Ryn Deep (New State Shares) ...	149,611
Village Main (Village Deep Shares) ...	106,200
	£845,832

In connection with these figures it must be borne in mind that the Geduld and Modder Deep enemy shares distributed amongst shareholders were purchased out of the profits earned by these companies, and if the special distributions are taken into account, as well as the ordinary cash distributions, it will be found that the total Rand gold mines dividend distributions for the year amount to £6,390,087, which compares very favourably with £5,330,966 for 1918.

The Far East's Contribution.

The Far East Rand area, as was only to be expected, again contributes the bulk of the profit distributions. In point of fact rather more than twelve shillings of each sovereign distributed by the mines of the Witwatersrand was derived from the mines east of Boksburg. The New Modderfontein's distribution of £980,000, or 70 per cent., heads the list. In 1918 this company paid out 51⅞ per cent. or £726,250, and the probabilities are that for the current year the company will distribute well over a million sterling.

Next to this comes the Van Ryn Deep with £718,134, made up of a 47½ per cent. cash distribution, and a bonus of one New State share for each 8 shares held in the Van Ryn Deep Company. Modder B pays out £647,500, or 92½ per cent., as contrasted with £577,500 (82½ per cent.) in the preceding year, and the Modder Deep Company's dividend is 115 per cent. or £563,095 in the aggregate, as compared with 97½ per cent. or £487,500 in 1918. The Government G.M. Areas' dividends aggregate £525,000 or 37½ per cent. which is 10 per cent. better than the former year's distribution. Geduld distributes eight shares per 100, which represents £172,000, and the Brakpan distribution of £224,365 is 27½ per cent. as against 32½ per cent in the preceding year. The Springs Mines Company has passed its dividends in order to put its financial house in order. This company is now in a sound position both as regards finance and development, and as future profits are available for distribution it can confidently be predicted that the company will resume the payment of dividends during the current year.

The Central Rand.

Amongst Central Rand properties the high distribution of the rich Meyer & Charlton calls for remark. The distribution for 1919 is 120 per cent. or £240,000 on a capital of £200,000, as compared with a dividend of £220,000 in the preceding year. The Village Deep resumes dividend distribution with a payment of 6¼ per cent., although recent monthly returns have been poor, and it is to be observed that the Rose Deep's rate is higher (17½ per cent., December, 1919, and 7½ per cent., June, 1919, as against 17½ per cent. for the whole of 1918). The Geldenhuis Deep distribution is also 2½ per cent. better, and the City Deep's December dividend maintains the rate of the 1918 distribution. Here again we see the direct influence of the gold premium. Few companies have been more favourably affected by the gold premium than the Crown Mines. In June last this concern distributed only 5 per cent., whereas the dividend at the year-end was 35 per cent. or £329,037. This tremendous improvement has been brought about by a reduction in working expenses and the selling of gold in the open market. Of the Goldfields mines on the Central Witwatersrand, the Simmer and Jack now distributes 2½ per cent., as compared with 1¼ per cent. for three previous half-years, and the Knights Deep, which has been absent from the dividend list for a long time, distributes 3¾ per cent.

The West Rand, by which we mean properties situated to the west of Roodepoort, makes no distribution at all, and from the west central section of the fields the aggregate profit distributed last month was £161,725, made up as follows:—

Consolidated Langlaagte	£71,250
Consolidated Main Reef	77,975
New Unified	12,500

A point that should be borne in mind is that the gold premium affects mines which are not yet in a position to pay dividends, as well as companies which have no liabilities and are in a position to distribute profits at present. In this respect the profits of the Randfontein Central will show a substantial increase when adjustments are made up on the gold premium at the end of the year. By the time our next issue appears the December output will have been declared, and we shall then be in a position to deal with the year's output and annual profits and costs, etc., of individual mines.

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THE GOLD PREMIUM: HOW LONG WILL IT LAST?

Views of Eminent London Financial Authority—In Absence of Legislative Interference Premium Will Remain till Foreign Exchanges Balance.

Mr. H. Strakosch, the Managing Director of the Union Corporation Group, is on a visit to the Rand, after an absence of many years. He is naturally impressed with the wonderful strides that the whole country has made in the interval since his last visit, and particularly with the evidences of prosperity that abound on the Rand. Mr. Strakosch was kind enough during the week to give a representative of this paper his views on the all-important question of how long the gold premium may last. As an acknowledged authority on currency and exchange questions in the City of London, Mr. Strakosch's views obviously carry great weight, and will be read with profound interest by all those to whom the maintenance of the gold premium is a matter of supreme practical importance.

We understood his opinion to be that the gold premium will last as long as the foreign exchanges remain adverse. He pointed out that during the years of the War England's foreign trade, her factories, her export trade, her roads, her transport, her shipping, all were sacrificed to win the conflict, and it must take time to rehabilitate all these activities before foreign trade can be brought to that state of perfect balance which is essential for the re-establishment of the foreign exchanges on a gold par. Until they return to normal the exchanges must remain adverse, and as long as they remain in that condition so long must gold remain at a premium. We must remember, said Mr. Strakosch, that during the War the foreign securities held in England—notably American securities—were also sacrificed to keep the exchanges favourable. Indeed, it may be said that all during the War the exchanges were kept balanced by artificial means, and this was only made possible by the utilisation of the vast accumulated and liquid wealth of England, which incidentally also enabled it to contract important loans abroad. Our shipping, we must not forget, has been sadly depleted by the submarine losses, and from allied and neutral nations there is to-day a great increase in the competition with England for the carrying trade of the world, the receipts from which constituted, with the interest on our foreign securities, so great a part of the "invisible exports" that went to make the foreign trade position of Great Britain of pre-War days so favourable.

Mr. Strakosch qualified this by adding that he supposes there would be no tinkering or interference with the natural course of the exchanges. It is, of course, possible that ill-considered measures might be introduced to artificially manipulate the exchanges, and any such much-to-be-deprecated action would, he felt strongly convinced, produce highly detrimental effects not only on production in South Africa generally, but on its whole economic structure.

Mr. Strakosch, it will be remembered, wrote a pamphlet in July, 1918, showing that a premium on gold was bound to come.

Mr. Strakosch has been too brief a time back on the Rand, after his prolonged absence, to express an opinion on current local questions, but later on, when he has had time to study them, we hope to print his views on our industrial problems.

S.A. Alkali Position.

Speaking at the annual meeting of the S.A. Alkali last week, the chairman, Mr. A. V. Lindberg, thus described the position: "An arrangement was entered into in July last with Mr. Clifford Jones, who had visited the property, and was convinced that he could so rearrange the plant that, without any large additions, our products could be turned out on a commercial basis. The process works quite satisfactorily, but in continuous working we discovered that the refrigeration at our disposal was insufficient, and steps are now being taken to remedy that defect. When we have the new freezing plant installed your directors are hopeful that the company will be in a position to make satisfactory profits. Since the end of the financial year, to provide funds to carry on, your directors, at the direction of yourselves, issued 5,000 shares at 30s. per share or a premium of 10s. per share. To show the confidence of the board in the company, I may tell you that the issue was underwritten by them. This issue was applied for more than twice over. It will in all probability be necessary to raise further capital shortly, but unless something unforeseen occurs there will be no difficulty in doing so. It must always be borne in mind that an industrial company of this sort must go through a period of difficulty and experiments before it becomes a great success. The reward of this, however, is so great that it is quite worth the patience of shareholders and the labour of the board."

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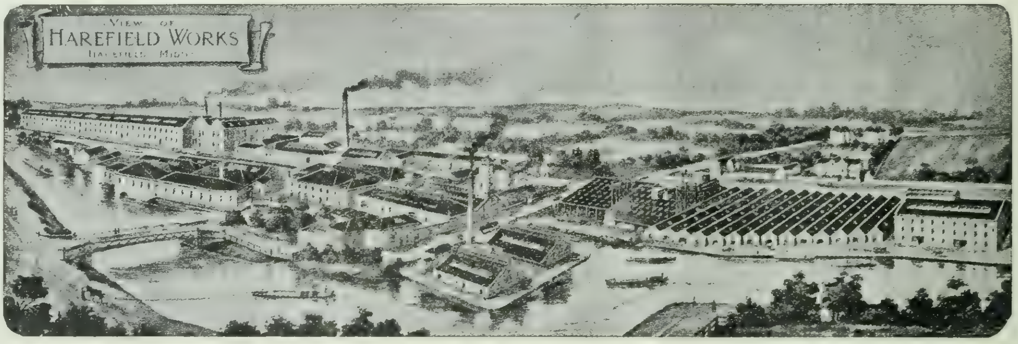

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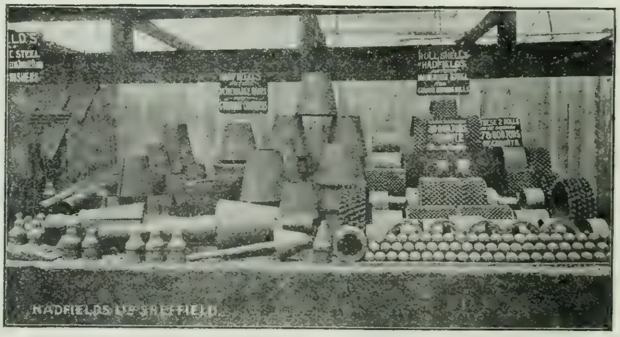

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THE TRANSVAAL SILVER AND BASE METAL FLOTATION.

Five per cent. Allotment—Shares and Options at a Substantial Premium—The Outlook for Silver.

"All allotments and regrets posted," was the position of the hard-worked office staff of the Transvaal Silver and Base Metals, Ltd., at the end of last week. The work of returning application monies and sending out the letters of allotment was completed with commendable expedition, though one or two applicants did complain that their bank balances were "tied up" during the holidays, which may have been to them a blessing in disguise. Apart from the very small applicants, all of whom got at least five shares allotted to them, the allotments were generally on about a 5 per cent. basis. It is a matter for regret that a larger issue was not offered, in view of the undoubted popularity of the present one. It is expected, however, that one or more subsidiary flotations may shortly be announced, and these will doubtless prove equally as attractive as the parent enterprise. The allotments have been dealt in at a substantial premium during the week; and Stock Exchange quotations will be obtained for both the shares and the options, which, it will be remembered, give the right to take a share at 25s. for a year from January 1.

The Silver Outlook.

The demand for silver and the present high price are likely to increase rather than diminish. One authority says: The return of erstwhile soldiers and War-workers to peaceful occupations will afford more labour for the mining industry, and, in so doing, increase the output of silver. Mexico, that great reservoir of precious metal, is setting her house in order, and will substantially swell the total. The hope that the high price of silver may be sustained cannot fail to stimulate new mines and reopen many that had ceased to be payable at pre-War rates. As long as the United States Government is pledged to re-purchase at $1 per oz. the bullion, composed of melted United States coin, which it placed at the disposal of the Indian Mint (at present amounting to 115,000,000 ozs.), the price cannot fall much, if at all, below 46d. (allowing for the return of the American exchange to a normal figure). If there were external competition with the United States Government, the re-purchase of this bullion, together with local trade requirements, would absorb probably two years' production of that country.

Trade all over the world has felt the lack of silver; hence a good and continuous demand may be expected from many quarters. As to coinage demand generally, no positive views can be expressed, for currency arrangements are now in a state of flux, rendering future policy as to the precious metals uncertain. In view of the shortage of gold that may prevail for many years to come, large supplies of silver for currency reserves may be considered desirable in other quarters. It must not be forgotten that many millions of silver medals will be struck. Indian coinage operations will depend on the harvests. As gold may be scarce for some years, the onus of supplying India with currency will fall upon silver. The deduction from the preceding remarks is that, although output may be accelerated, the needs of India and China, the obligation of the United States Government to re-purchase, and the accumulated demand for the trade, will ensure a high level of prices for some time.

The Price of Lead.

According to the *Mineral Industry* review of the lead position, "a severe world shortage of lead was felt during the last few months of the War, despite an apparent glut in the market towards the end of last year. Production was pushed to the utmost at all mines and smelters, but hampered by the scarcity of labour, its inefficiency, and high price, but more particularly by the scarcity and poor delivery of needed supplies, the maintenance of record production being impossible. Prices were controlled either by Government action, or by agreement of producers, in such a way that a runaway market did not follow the shortage of supply."

MINING INSTITUTE.

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RESULTS.—42 Managers' Certificates out of 55 in S.A., and 36 Overseers' Certificates in a recent 12 months; 15 Managers' Certificates (1 conditional) to date (1919) and only one failure in the Overseers' Examination in the last four months.

Greatly reduced fees. Survey Class just started. Overseers' Class may be joined at any time. Reef Classes where desired.

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PERSONAL.

Mr. Ashe, the well-known mining engineer, late Capt., R.N.R., has joined the board of the Geluk Oils.

* * * *

Mr. Wm. Cullen was given a farewell lunch last Saturday by representatives of the mining and commercial communities of the Rand.

* * * *

Mr. R. W. H. Ferguson, who during the War period has been manager for Messrs. John Tullis & Son, Ltd. (belting specialists), has resigned his position to return to his old profession of stock and share broking. Mr. Ferguson is commencing business in partnership with Mr. C. B. Malloch, who, prior to going on active service, was a director of the First S.A. Cordage and Spinning Co. and Hannam & Co., Ltd. The new firm have opened offices at Beresford's Buildings, Main Street, opposite the Commercial Exchange.

* * * *

Mr. G. F. Wills, of 5 New Club Buildings, Johannesburg, who recently returned from England, and who for many years has controlled in South Africa the interests of Messrs. Edgar Allen & Co., Ltd., Sheffield, Taylor Bros. & Co., Ltd., Leeds., and The Vulcan Foundry Co., Ltd., Locomotive Works, Newton-le-Willows, has also been appointed representative in South Africa and Rhodesia of The Metropolitan Carriage, Wagon and Finance Co., Ltd., Birmingham, Patent Shaft and Axletree Co., Ltd., and Messrs. Docker Bros., Ltd., Birmingham.

Victoria Falls and Transvaal Power.

The net earnings of the Victoria Falls and Transvaal Power Co., Ltd., including those of the Rand Mines Power Co., Ltd., for the quarter ended September 30, 1919, amounted to £219,784, before providing for taxation in South Africa and the United Kingdom.

Leeuwpoort Quarterly Report.

The report of operations for the quarter ended 31st December, 1919, is as follows: Stamps, 17 (including 2 Nissen); time run, 82·12 days; tons crushed, 14,639 short tons; concentrates won, 248 long tons. Average assay value of concentrates is 62·028 per cent. metallic tin. Average price of metallic tin on which the quarter's revenue has been determined is £286 18s. per ton. Estimated profit, £13,805 4s. 1d. Adjustments in respect of previous shipments, £2,575 6s. 5d. Profit for quarter, £16,380 10s. 6d. Capital expenditure: The sum of £450 5s. 9d. has been expended for machinery, buildings, shaft sinking, etc. During the quarter a sum of £2,927 16s. for development redemption has been included in working costs.

THE YEAR WITH THE CONSOLIDATED GOLD FIELDS.—III.

Mining and Financial Conditions Reviewed—The Low Grade Mines' Position—Points from the Annual Reports.

The following is the continuation of the report of the Consulting Engineer of the Consolidated Goldfields for last year:—

Cost of Materials. Prices of mining stores have come down to some extent already. This is not yet, however, reflected appreciably in our working costs, principally owing to the accumulation of large stocks of high priced material which are now being worked off gradually. Of the total of £1,380,000 spent by our group of mines on mining materials during the year, about £590,000, or 42½ per cent., represented the cost of imported articles and about £790,000, or 57½ per cent., the cost of local products. Industrial conditions in England and America do not tend to give encouragement for any hope of a marked reduction in the manufactured cost of imported articles for some time. In the measure as the shipping companies are able to resume normal sailings and more freight accommodation becomes available owing to the ships at present controlled by the Imperial Government being returned to them, the cost of freight will no doubt come down, though possibly not to the pre-War figure. The cost of local products tends for the present to be governed by considerations of competition with the imported article, and this will continue to be the case until the development of industry in this country begins to give rise to internal competition. While, therefore, we may expect a little relief in this direction, it will be some appreciable time before we can anticipate any marked reduction of cost, and we should turn to a policy of fostering and encouragement of local manufactures (dependent as little as possible upon the importation of raw materials) with a view both to lessening our dependence on overseas industrial conditions and to being able, by creating internal industrial competition, to take full advantage of cheaper local manufacturing costs.

Government Taxation.—In view of the unsympathetic attitude of the Government towards the mining industry, we cannot for the present hope for much relief from the burden of taxation. Customs duties will fall in proportion to any decrease in the costs of imported materials. On the other hand, they may rise as a result of any policy of protection for local industries. In accordance with the assurance of the Union Government given at the time when it imposed a special war levy on the mining industry through the medium of the profits tax, that this additional tax was to be of a temporary nature and as a war measure only, a reduction of 25 per cent. should shortly be obtained on the amount payable by the mines under this heading. It is possible, however, that as a result of the investigations of the Low Grade Mines Commission, our poorer mines may get some benefit from the reduction of railway rates, claim licences, and passport fees, but any benefits we may get from these sources will be very largely, if not entirely, offset by the immense additional burdens imposed by the new miners' phthisis legislation. This legislation, which confers benefits to an extent previously unheard of in any occupational disease legislation, and which over the next five years is estimated to cost the mines £3,800,000 in excess of what they would have had to bear under previous Acts, was passed without consulting the industry whom it most affected, and, admittedly, without any steps having been taken, prior to its passing, to make any accurate calculation of its effect on that industry.

Labour Natives.—As to labour, the native position would be materially improved by permission to recruit in territories north of latitude 22 degrees S.; strong representations to this effect have been made to the Low Grade Mines Commission. In other respects, short of a recurrence of the influenza epidemic, which so seriously affected our native labour force during the period under review, the native labour position may be expected to return to normal, with its usual seasonal shortages, subject, however, to the qualification that increased industrial competition for labour may tend to divert certain classes of labour from the mines. Native efficiency must, on the whole, rise or fall in direct proportion to the rise and fall of the efficiency of the white supervision, but a modification of the existing artificial colour bar restrictions, which would permit of the advancement of selected natives to more responsible and higher-paid positions, would tend to operate favourably on the average native efficiency by giving them a higher objective to work for, and this view has recently been strongly emphasised before the Low Grade Mines Commission.

Labour, Europeans.—We are left to the consideration of the factor of European labour. The majority of those of our employees who joined for service have now returned to us, and to that extent we are so much to the good. The renewed co-operation of those older and more settled employees, especially on our mine staffs, cannot have other than a good effect. We will be relieved from the payment of war allowances, which, during the last five years, have amounted to £155,000. During the War period substantial increases have been made in wages paid to workmen and concessions have been granted in the matter of leave and shorter hours of work. In addition, war bonuses have been paid, calculated upon the increased cost of living. The effect of all these concessions, as well as the reduced output per man, are very clearly shown in the consulting engineer's report.

Under the more settled conditions consequent on the return to work of our regular employees, the respective mine managements should be in a better position to improve the output per man. As mines get older and require more support for their workings there is, apart from considerations of efficiency, a continual downward tendency in the output per employee, but making all allowances for this, there still remains plenty of scope for improvement. It is in this direction that our principal effort will have to be made during the coming years. We cannot expect, at any rate for some considerable time, that we will get back to pre-War conditions under any of the above headings, with the possible exception of native labour. The material and moral effects of the War period can only be eliminated gradually, and we cannot therefore look for any quick rate of improvement.

Price of Gold.—Apart from the above, the new arrangement for the sale of gold is a favourable factor, though it is not possible at date to forecast the extent to which it will help us or to determine the period over which a premium will be obtainable.

Pay Limit.—The underground position of our mines has naturally suffered as a result of the necessity, due to higher working costs, of taking a higher pay limit, and the consequent elimination of large areas of previously payable ore. The figures quoted in the consulting engineer's report show in every case reduced tonnages of ore reserve, the reduction corresponding in each case very closely with the tonnages contained in eliminated areas. As costs fall, these areas will come back into the reserves.

Curtailment of exploratory work on poorer mines.—In the case of our poorer mines, the high cost of development has also made it necessary largely to curtail exploratory work and limit development to known payable areas, and to some extent this has had a permanent effect on the underground prospects of those companies.

Low Grade Mines Commision.—At the time of writing it is not possible to estimate what benefits, if any, are likely to accrue to the industry from the investigations of the Low Grade Mines Commission. This Commission was appointed at the end of June, 1919, and has taken evidence from Mr. E. Birkenruth and Mr. C. D. Leslie regarding the mines controlled by the company. The Commission has now sent in an emergency interim report to the Government. In view of the critical state of the finances of the Simmer Deep, it is important that any relief which is to come from this source should come quickly.

(To be continued.)

THE YEAR'S DIVIDENDS IN DETAIL.

Last Year's Rand Total Exceeded—Influence of the Gold Premium—Valuable Far East Rand Contributions.

THE following is the gold mining dividend list for 1919, showing the corresponding rates for 1918:—

WITWATERSRAND GOLD MINES.

	Date:	Rate per cent.	Capital £	Amount £	Total for 1919 Rate %	Total for 1919 £	Rate % 1918
Brakpan Mines	June	12½	806,600	100,825	27½	224,365	32½
	Dec.	15	823,600	123,540			
City Deep	June	10	1,250,000	125,000	23¾	296,875	27½
	Dec.	13¾		171,875			
City and Suburban	—	—	1,360,000	—	—	—	1⅞
Consolidated Langlaagte	June	5	950,000	47,500	12½	118,750	5
	Dec.	7½		71,250			
Consolidated Main Reef	June	2½	1,247,602	31,190	8¾	109,165	6¼
	Dec.	6¼		77,975			
Crown Mines	June	5	940,106	47,005	40	376,042	20
	Dec.	35		329,037			
Durban Roodepoort	—	97½	125,000	121,875	97½	121,875	—
Durban Roodepoort Deep	—	—	440,000	—	—	—	2½
Ferreira Deep	Mar.	7½	980,000	73,500	12½	122,500	22½
	Sept.	5		49,000			
Geldenhuis Deep	June	2½	585,753	14,644	10	58,575	7½
	Dec.	7½		43,931			
Glencairn.	—	—	550,000	—	—	—	5
Government G.M. Areas	June	17½	1,400,000	245,000	37½	525,000	27½
	Dec.	20		280,000			
Geduld Proprietary	Dec.	8 shares per 100	1,117,229	172,908	—	172,908	11¼
Jupiter	—	—	1,014,200	—	—	—	1¼
Knights Deep	Dec.	3¾	743,526	27,882	3¾	27,882	—
Langlaagte Estate	June	7½	886,500	66,487	15	132,974	12½
	Dec.	7½		66,487			
Meyer and Charlton	June	50	200,000	100,000	120	240,000	110
	Dec.	70		140,000			
Modder B.	June	45	700,000	315,000	92½	647,500	82½
	Dec.	47½		332,500			
Modder Deep	June	50	500,000	238,095	115	563,095	97½
	Dec.	65		325,000			
New Modderfontein	June	32½	1,400,000	455,000	70	980,000	51¼
	Dec.	37½		525,000			
New Primrose	June	5	325,000	16,250	10	32,500	—
	Dec.	5		16,250			
New Unified	June	5	250,000	12,500	10	25,000	10
	Dec.	5		12,500			
Nourse Mines	Dec.	3¾	827,821	31,043	3¾	31,043	3¾
Robinson	June	5	2,750,000	137,500	7½	206,250	2½
	Dec.	2½		68,750			
Robinson Deep	—	—	806,807	—	—	—	—
Rose Deep	June	7½	700,000	52,500	25	175,000	17½
	Dec.	17½		122,500			
Simmer and Jack	June	1¼	3,000,000	37,500	3¾	113,000	1¼
	Dec.	2½		75,500			
Springs Mines	—	—	1,153,500	—	—	—	—
Van Ryn	June	5	500,000	25,000	12½	62,500	10
	Dec.	7½		37,500			
Van Ryn Deep	June	22½	1,196,892	269,300		718,134	15
	Dec.	25		299,223			
Bonus New States—1 for 8				149,611			
Village Deep	Dec.	6¼	1,060,671	66,292	6¼	66,292	3¾
Village Main Reef	June	22½	472,000	106,200	32½	153,400	10
	Dec.	10		47,200			
Witwatersrand	June	5	469,625	23,481	10	46,962	15
	Dec.	5		23,481			
Wolhuter	April	2½	860,000	21,050	5	43,000	6¼
	Oct.	2½		21,500			

OUTSIDE DISTRICTS GOLD MINES.

	Date:	Rate per cent.	Capital £	Amount £	Total for 1919 Rate %	Total for 1919 £	Rate % 1918
Glynn's Lydenburg	Jan.	2½	170,000	4,250	5	8,500	16¼
	July	2½		4,250			
Sub Nigel	June	5	775,000	31,250	10	62,500	11¼
	Dec.	5		31,250			
Transvaal G.M. Estates	Sept.	3¾	604,225	22,658	3¾	22,658	6¼

THE PAST AND FUTURE OF THE SHEBA.

Fully Equipped Mine to Restart Crushing—The Question of Faults—Points from Consulting Engineer's Report.

The Sheba is to be re-opened and to restart crushing as soon as possible. That is the decision of the directors after considering Mr. C. B. Kingston's report, which is as follows: "Work on the Sheba Mine was suspended during the War, because operations were being carried on at a loss, owing in part to the increased cost of all stores and material under war conditions, but mainly owing to the exhaustion of the last high-grade ore body discovered and developed in the Zwartkopje Mine. The Zwartkopje Mine has been the mainstay of the company since the old Sheba Mine proper was closed down. Other mines, such as the Insimbi and the Intombi, have been discovered and worked with some measure of success, but with fluctuating results. These mines have yielded some good ore, but variations in grade and difficulty in treatment would have made it impossible to work these mines alone, except on a very small scale. They have contributed usefully to the general output, but the Zwartkopje has been the main producer. The Zwartkopje has been a high grade mine, consisting of a series of detached ore bodies. Each of these detached bodies has yielded a large tonnage of ore, but, nevertheless, periods of prosperity have been succeeded by periods of depression, because each detached body in turn has been worked out before the next was found and developed. The character of these ore bodies, and their relation to each other, was not clearly understood until the work in the mine had been advanced to its present stage. It is now clear that these ore bodies are associated with a number of faults constituting a series of step faults, descending from east to west. These faults have always been referred to in correspondence as 'fractures.' These faults in turn appear to increase in extent as the series goes westwards, suggesting that the centre of the main disturbance that produced the faults is being gradually approached.

A Common Experience.

"It is a common experience to find heavy faults, accompanied by a series of lesser faults, radiating from the main centre of upheaval. The Zwartkopje provides a fine example of this. From the data provided by the plans and surveys of the mine it was calculated that by sinking to a depth of between 200 and 250 ft. from the west end of the 7th level the next fault in the series ought to be encountered. A winze was sunk and a fault was encountered at a depth of 230 ft. below the 7th level, thus affording somewhat convincing confirmation of the theory that the Zwartkopje ore bodies are associated with a descending series of step faults. The indications so far observable point to this last discovered fault as being greater than any of the other members of the series, thus being out the view that the centre of the whole system of faults lies to the west. Whether or not this last discovered fault is itself the centre of the system remains to be determined. Unhappily, it became necessary to close down the mine before this last fault was thoroughly explored to determine to what extent payable ore may be associated with it. The ore bodies in these faults have been formed by impregnation of the surrounding schist with auriferous pyrites. . . . The presence of the Insimbi and the Intombi faults in the neighbourhood of the last discovered fault in the Zwartkopje represent the centre of the disturbance. If this is the case, a series of ore bodies corresponding to those already worked in the Zwartkopje mine may be looked for further to the west, and as soon as the last fault has been explored work ought to be directed to the discovery of new members of the series. If a large body of ore is found in the last discovered fault it will have to be worked either through a crosscut from the Intombi shaft or by a subsidiary internal shaft sunk from the 7th level in the Zwartkopje mine. . . . It is useless to prepare an elaborate estimate of the prospects of the mine; it is impossible to prepare a reliable estimate. The simple fact is that very fine bodies of ore have been found in the mine in the past, and there is an excellent prospect of finding more fine bodies of ore in the future, as part of the series of which we now seem to have a clear understanding. If the work is pressed vigorously several bodies of ore may be exposed simultaneously, and the whole enterprise may be re-established on a sounder basis than ever before. I consider that the work ought to be undertaken, and I advise the board to take the steps needed to provide the money for this purpose."

Commenting on the foregoing at the recent annual meeting in London, the Chairman, Mr. C. F. Rowsell, said: "To my mind this report is conclusive as to the advisability of the course which we recommend you to pursue, but I should like to remind you of one or two other factors in connection with the Sheba Company. In the first instance I would remind you that the Sheba Mine was one of the earliest gold discoveries in the Transvaal—in fact, I might say, the first important gold discovery in the Transvaal, and this discovery took place so far back as the year 1886. Since it has been working the Sheba property has produced no less than 1,011,920 ozs. of gold, and of this amount 383,475 ozs. were produced during the working of the present company. I might also remind you that we have paid in dividends during the history of the company no less than £888,836, and that this company itself has paid to its shareholders by way of dividends £168,586. The next point of which I wish to remind you is that the Sheba Co. is fully equipped, its plant consisting of 120 stamps, concentrating machinery, furnace for roasting concentrates, plants for treating tailings, slimes, and concentrates by cyanide process, steam tramway, with rolling stock connecting mine with railway, plant for generating electricity by means of water taken from the Queen's River, steam plant for producing additional electrical power, air-compressing plant for mine drills, and well-equipped shops with all requirements for ordinary repairs, etc., and I will also remind you that during the past three years no less a sum than £10,600 has been expended in improvements on our plant with a view to improving the extraction.

The Gold Premium.

"You will see therefore that the new company will start fully equipped, and in fact I may say that we are in communication with our consulting engineer with reference to an early start in crushing, as the very great increase which has taken place in the value of gold will render the reserves, which were estimated to amount to 58,000 tons of an approximate value of 7 dwts. per ton, profitable ore for treatment. I would like, also, to emphasise the importance to the new company of this change in the value of gold. While the difference of 21s. per ounce in the value of gold naturally has an immense effect upon the earning capacity of all gold mines, it is those mines which are on the verge of payability which are most deeply affected by the increase in value, because many thousands of tons of ore, which before would have been cast aside as non-payable, will under the new conditions be thoroughly worth treating. I do not think that I need detain you longer, because I feel sure that you are all in agreement with me that not only are we fully justified in raising further capital for the Sheba mine, but that the future holds out great prospects of success for the new company."

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First Class Analytical Chemist.—One used to Dyes and Colourings. Apply immediately to

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THE DECEMBER OUTPUT: GROUP RETURNS.

Barnato Group.

The results of operations of the Barnato group for December are as follow:—

Mine.	Stamps.	Tons Crushed.	Revenue from Gold
Consolidated Langlaagte ...	100	35,100	£48,781
Government Areas	180	103,000	194,591
Langlaagte Estate	200	33,670	38,879
New Primrose	100	15,000	15,900
New Unified	60	10,500	11,579
Randfontein Central	600	133,500	153,326
Van Ryn Deep	90	47,300	108,163
Witwatersrand	215	29,550	35,459
Totals and averages ...	1545	407,620	£606,678
November totals	1545	416,700	£619,179

Mine.	Total Working Costs.	Working Costs per Ton Milled. Shillings.	Gross Profit including Sundry Revenue.
Consolidated Langlaagte ...	£42,748	24·358	£6,377
Government Areas	119,974	23·296	75,244
Langlaagte Estate	39,793	23·637	*775
New Primrose	15,652	20·869	342
New Unified	10,098	19·235	1,513
Randfontein Central	166,448	24·936	*12,146
Van Ryn Deep	53,157	22·476	56,058
Witwatersrand	34,350	23·249	2,591
Totals and averages ...	£482,220	23·660	£129,204
November totals ...	£474,252	22·762	£148,814

*Loss.

Monthly Gross Profit.—January, £162,943; February, £154,054; March, £179,310; April, £180,785; May, £190,416; June, £184,687; July, £194,398; August, £170,255; September, £176,048; October, £180,188; November, £148,814; December, £129,204.

Operations of all companies adversely affected by Christmas and extra holiday, Dingaan's Day. In addition Randfontein Central and Langlaagte Estate suffered from severe shortage of native labour, and the latter company's poor result is also due to low-grade ore crushed.

Average premium on gold obtained to date amounts to 19 per cent., and the estimated additional profit earned under this head will appear in the companies' annual reports. From and after January profit declarations will include the approximate premium estimated to be earned on the gold produced for each month.

Transvaal G.M. Estates.

The following are the particulars of the output of the Transvaal G. M. Estates for the month of December:—Central Mines: Tons crushed, 12,450, yielding 4,254 fine ozs. Elandsdrift Mine: Tons crushed, 1,380, yielding 995 fine ozs. Vaalhoek Mine: Tons crushed, 1,880, yielding 733 fine ozs. Estimated value of month's output, £25,719; estimated profit for the month, £2,965.

Glynn's Lydenburg.

The following are the particulars of the output of Glynn's Lydenburg for the month of December—Tons crushed, 2,930, yielding 1,109 fine ozs. Estimated value of month's output, £1,689; estimated loss for the month, £61.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of December of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs	Total Profit
Simmer and Jack ...	320	7	43,500	11,418	*£1,072
Robinson Deep	130	9	46,900	16,463	6,166
Knights Deep	400	11	80,900	13,932	*9,289
Simmer Deep	220	10	21,800	5,924	*13,635
Jupiter	80	5	11,300	3,337	*8,126
Sub Nigel	30	2	8,200	5,682	4,873
Totals	1,180	44	212,600	56,756	*£21,083

*Loss.

Gold in reserve.—Simmer and Jack, 625 ozs.; Robinson Deep, 1,213 ozs.; Sub Nigel, 1,930 ozs.; total, 3,768 ozs.

Estimated profit or loss on basis of the gold realising £5 per fine oz.: Simmer and Jack, £8,158 profit; Robinson Deep, £19,473 profit; Knights Deep, £1,973 profit; Simmer Deep, £8,847 loss; Jupiter, £5,428 loss; Sub Nigel, £9,475 profit; total, £24,804 profit.

Note.—In the case of Simmer and Jack, Robinson Deep, Knights Deep and Sub Nigel, the decreased profits are due to scarcity of native labour and to two public holidays, when the Europeans and natives were paid; and also to the increased bonus to employees on account of the cost of living. Moreover, at the Knights Deep there was a heavy fall of ground in the Nos. 14 and 15 levels of the Connor shaft in the middle of December, which further reduced the tonnage to the mill, but ore is now again being obtained from these levels and the native labour position has considerably improved, so it is expected that work will be carried on under normal conditions for the month of January. In the case of Simmer Deep and Jupiter mines, the losses are due to the strike troubles, which are now settled.

Marketing of Gold.—The average premium obtained to date amounts to 19 per cent., and the estimated additional profit earned will appear in the companies' annual reports. From and after January the profit declarations will include the approximate premium estimated to be earned on the gold produced each month.

Albu Group.

The following information is supplied regarding the December operations of the producing mines of the General Mining group:—

Company	Tons Crushed.	Cost.	Cost per Ton.	Total Revenue.	Profit.
Aurora West ...	14,000	£17,089	24·41	£14,482	*£2,607
Meyer & Charl.	12,500	16,812	26·90	37,317	20,505
New Goch ..	13,500	13,590	20·13	13,001	*589
Roodepoort Un.	21,200	25,266	23·84	22,236	*3,030
Van Ryn Est...	31,700	29,108	18·36	31,620	2,512
West Rand Cn.	28,170	35,371	25·11	32,914	*2,457
	121,070	£137,236	22·67	£151,570	£23,017
				Less losses	£8,683
					£14,334

* Loss.

Continued shortage of native labour, together with loss of tonnage and revenue due to the holidays on Dingaan's Day and Christmas Day, adversely affected the results obtained from all mines of the group. The average premium obtained to date amounts to 19 per cent., and the estimated additional profit earned will appear in the companies' annual reports. From and after January, profit declarations will include the approximate premium estimated to be earned on the gold produced for each month.

Central Mining/Rand Mines Group.

The following are the results of crushing operations of the Central Mining/Rand Mines companies for the month of December:—

Company.	No. of Stamps Running.	Tube Mills	Tons crushed.	Total Fine Ozs.	Total Estimated Profit.	Estimated Working Costs per Ton.
City Deep	A154	10	54,000	23,204	£23,248	27/10
Cons. Main Reef	220	6	41,000	16,829	5,803	31/ 5
Crown Mines ...	660	26	155,000	49,229	24,001	25/ 1
Dur. Rood. Dp..	100	3	19,800	6,458	*8,750	36/ 4
East Rand Prop.	440	19	112,000	35,692	2,666	26/ 9
Ferreira Deep ...	160	7	31,000	10,067	232	27/ 4
Geldenhuis Deep	300	7	44,000	12,269	*7,283	27/ 4
Knight Central ..	120	3	19,000	6,565	*1,219	31/ 7
Modder B.	B104	8	51,000	24,104	38,719	25/ 7
New Modder ...	C236	15	75,600	40,749	90,583	22/ 0
Nourse Mines ...	180	5	37,700	12,066	*4,123	29/ 2
Robinson ...	215	6	38,900	9,675	*254	21/ 3
Rose Deep	300	7	45,000	11,601	1,712	21/ 9
Village Main Rf.	130	4	20,000	5,694	1,354	22/ 9
Wolhuter	120	4	25,000	8,359	2,896	25/ 9
Village Deep	180	7	42,200	13,375	*7,468	30/ 9
Tls. & averages	3,619	137	811,200	285,936	£162,117	26/ 3

A Includes 4 Nissen stamps. B Includes 24 Nissen stamps.
C Includes 56 Nissen stamps.

* Loss.

The working costs of all companies have been increased by holidays on Dingaan's Day and Christmas Day, during which white and native employees received usual wages; also by provision for two months' additional allowances recommended by Chamber of Mines in respect of increased cost of living. The native labour supply continues inadequate for most of the companies, which with the holidays referred to has affected the tonnage outputs. The published results do not include the increased price now being obtained under the new arrangements for the free disposal of the gold shipped since 25th July last. The gold so far sold has realised a premium of approximately 19 per cent.; the estimated additional profits earned will appear in the companies' annual reports. For the month of January and onwards profit declarations will include the approximate premium estimated to be earned on the gold produced for each month.

Consolidated Mines Selection Group.

The following are the results of operations for the month of December, 1919:—

	Stamps Working.	Tons Milled.	Working Costs per Ton Milled
Brakpan Mines	110	44,100	30/10·494
Springs Mines	80	35,900	28/ 7·484
Totals and averages ...	190	80,000	29/10·374

	Value of Gold declared.	Yield per Ton.	Working Profit.	Working Profit per Ton.
Brakpan Mines ...	£87,416	39/ 7·734	£19,338	8/ 9·240
Springs Mines ...	67,877	37/ 9·771	16,497	9/ 2·287
Totals & averages	£155,293	38/ 9·879	£35,835	8/11·505

(a) The average premium obtained to date amounts to 19 per cent. and the estimated additional profit earned will appear in the companies' annual reports.

(b) From and after January, profit declarations will include the approximate premium estimated to be earned on the gold produced for each month.

Brakpan.—Taken from gold reserve, 1,000 fine ozs.; balance reserve at date, 3,724 fine ozs.

Union Corporation.

Results of operations on the producing mines of this group for the month of December:—

Company	Stamps.	Tons Crushed.	Total Revenue.	Revenue per ton.
Geduld Proprietary	100	43,500	£68,608	31/ 6
Modder Deep Levels ...	70	41,100	98,099	47/ 9
Princess Estate	60	16,700	20,081	24/ 1
Totals	230	101,300	£186,788	—

Company.	Costs.		Profit.	
	Total.	Per Ton.	Total.	Per Ton
Geduld Proprietary ...	£49,552	22/ 9	£19,056	8/ 9
Modder Deep Levels ...	43,294	21/ 1	54,805	26/ 8
			£73,861	
Princess Estate	27,872	33/ 5	*7,791	9/ 4
Totals	£120,718	—	£66,070	—

* Loss.

Princess Estate.—This company's results were again adversely affected by native labour shortage.

The average premium obtained to date amounts to 19 per cent. and the estimated additional profit earned will appear in the companies' annual reports.

From and after January, profit declarations will include the approximate premium estimated to be earned on the gold produced for each month.

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THE NEW OIL INDUSTRY OF SOUTH AFRICA.

By "Oleŭm."

In order to indicate what a magnificent field obtains in South Africa for a home industry in mineral oils and oil products, even leaving the possibility of establishing an export trade out of consideration altogether, one has only to glance at the figures appertaining to the imports of mineral oils into the Union of South Africa during the last three years. During the year 1916 there was imported 23,470,141 gallons of mineral oils, valued at the place of production at £843,566, and 28,368,999 pounds of paraffin wax valued at £300,240, consisting—as regards oils—of lubricating oils, motor spirit (including benzine and naptha), paraffin and other oils not classified. In 1917 these values had increased to £1,144,468 and £404,185 respectively and were in 1918 £1,078,001 and £545,731 respectively. To the field coming under the operations of such an industry must be further added Rhodesia, the Protectorate of S.W. Africa, and the Portuguese colonies, whose imports of mineral oils are fairly considerable.

Oil Shale Possibilities.

We know that oil shales have been profitably worked in Scotland and France since the middle of last century. The oil shale occurs in beds and layers as members of a stratified formation and yields mineral oil by slow destructive distillation. In Scotland, where the shale deposits are of great extent but of poor quality, the companies exploiting them are reported to have averaged in recent years an annual profit of about 18 per cent. This is chiefly due (the shale being low in oil contents) to the by-products recovered by the shale-oil distilleries from the crude oil by the application of different degrees of heat. Thus sixteen different products are obtained from the shale, viz., crude oil, sulphate of ammonia, chrysene, naptha, motor spirit, gas oil, lubricating oil, paraffin wax, sulphuric acid and coke. In addition gas is given off during the treatment of the rock most of which is used as fuel, thereby reducing the cost of furnishing heat for the various operations.

The present time is singularly opportune for the founding of a home oil industry in this country; mining costs are much lower here than in other countries; many authorities declare that the great and steadily increasing rate of consumption of oil threatens to exceed the available supply within a comparatively few years, and there are signs not wanting, on the horizon, that we shall have to look more and more to our oil shales to supplement, and probably ultimately to replace, the rapidly diminishing supply from oil wells of that vital fluid of industry and commerce for which increasing demand for new purposes is being found every day. In France, it is reported, the railways are preparing to convert their engines to burn oil, owing to the bad quality of the coal obtainable, while on the South American railways oil is gradually but surely replacing coal for fuel purposes.

An Expert's Views.

We believe that the chances of finding liquid oil in this country, such as the "gushers" or oil wells of America, are anything but hopeful, and we are reminded in this connection of what the well-known oil expert Mr. Cunningham Craig stated a few years ago. With the express object of gaining the fullest and most valuable information with regard to the petroleum prospects of this country, the Union Government in 1913 engaged the services of E. H. Cunningham Craig, B.A., F.G.S., formerly Government Geologist of Trinidad, and one of the leading British petroleum experts, to make an exhaustive investigation. His report, dated 26th September, 1913, which was issued as a Parliamentary blue book, shows, *inter alia*, that the prospects of finding liquid oil either in shallow formations or at depth are extremely remote; on the other hand, with regard to the possibilities of an oil shale industry he appears to have been favourably and strongly impressed. Indeed, he urged the Government to encourage the opening up and development of the various oil shale deposits of the country. He said: "All the evidence to hand at present leads to the belief that an oil shale industry has good prospects of proving successful, and I would urge that no effort should be spared to ensure that a fair test of its possibilities be made."

Now the public may not be aware that some of his most exhaustive investigations were made with respect to certain farms near the town of Wakkerstroom, on the border line between the Transvaal and Natal Provinces. Mr. Cunningham Craig stated that the conditions in this district were such as to promise great success. The following is quoted from his report: "Taking mining costs at 4s. per ton as a maximum and taking 20 gals. of crude oil per ton and 50 lbs. of ammonium sulphate (a by-product from oil shale) as a minimum—figures which may, and no doubt will, be easily exceeded—the ammonium sulphate alone will be sufficient to pay the cost of mining nearly twice over, and the crude oil when refined to produce a maximum of petrol and lubricating oil, should enable a very handsome profit to be made after deducting interest on capital, managing and refining expenses." He estimates that from oil shale yielding only 20 gals. crude oil to the ton, a nett profit of 10s. per ton would be made. This is, of course, based on the wholesale prices of petrol and lubricating oils in South Africa at the date of his report, since when prices have greatly appreciated.

Moderate Estimates.

Recent investigations in this same district show that the figures of 20 gals. of crude oil and 50 lbs. of ammonium sulphate per ton of shale—upon which Mr. Cunningham Craig based his estimates—are comparatively moderate so

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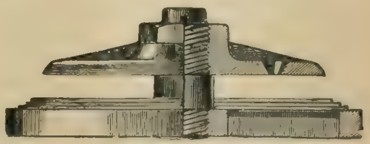

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far as the Wakkerstroom district is concerned and are largely exceeded in several areas. From a sample tested by Dr. J. Norman, of the City Central Laboratory, London, 40·6 gals. per ton of crude oil was obtained and 57 lbs. of ammonium sulphate per ton. From samples taken and tested by Dr. A. E. Blair, who spent a considerable time on these fields representing the Union Oil Company of South Africa and who carried out fairly extensive operations on their behalf, 36·5 gals. per ton was obtained, while 50·65 gals. per ton has recently been recorded from a sample taken from one of the newly opened faces on the property of the African Oil Corporation. In fact, crude oil returns ranging up to 90 gals. per ton of shale have been obtained, and the deposits are evidently continuous and fairly consistent in values over wide areas. The oil shale beds in the Wakkerstroom district appear to be more favourably conditioned as regards thickness, average yield of crude oil, ammonium sulphate, etc., and general working and transport facilities than those of any other known district. A good quality of coal over a working thickness, plenty of timber for mining purposes, flowing and permanent streams of water (all necessary adjuncts making for working conditions almost ideal and most economical) are found here.

THE GELUK OCCURRENCES.

The shale beds have been found running through the farms Morgenzon 163, Goodgeloef 279, Kromhoek 76, Virginia 371, and Geluk 230, and samples taken have yielded as high as 60 gals. per ton. We understand the last-mentioned property, Geluk 230, immediately adjoining the farm Virginia, has been floated into a company with a view to carrying out the necessary prospecting and exploratory work, to prove the richness of the seams thereon, of which, we understand, there are four. The property would appear to have the superior advantage over all the other properties mentioned in this district in being nearer the railway which should make for cheaper working, and we may say that those who are competent to judge of the value of this property hold a very high opinion of its prospects, if intelligently prospected and worked. It would appear that the shale beds on this farm are a continuation of those found on the farms Kromhoek and Virginia adjoining, upon which the main seam was of excellent thickness, averaging about six feet, and the values of which pointed to a high degree of payability, and we have no reason to anticipate that the shales on Geluk or their values shall prove in any way inferior, and consider it promises great hopes of success.

ANSWERS TO CORRESPONDENTS.

All enquiries addressed to the Editor must bear the writer's name and full address. We cannot reply to enquiries by letter, but telegrams with replies prepaid will be answered. Correspondents are requested to write their names and pseudonyms distinctly.

"W. V."—Dealt with in this issue.

"M. N. D."—Plans for restarting are being considered.

"A. J. B."—(1) You should certainly hold on, in the circumstances. (2) The dividend announcement appears in this issue. Delay probably due to cables.

"Anxious."—(1) Yes. (2) Particulars too meagre to warrant action. (3) 5 per cent.

"Shareholder."—The prospects and prices of both metals are dealt with in this issue.

"X. Y. Z."—Better leave it alone.

Northern Transvaal Lands.

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THE WEEK IN THE SHAREMARKET.

A Buoyant Opening—Far Easterns Make Up Dividend—Transvaal Silvers in Favour.

The market opened with a very buoyant tone after the holidays. Monday and Tuesday saw continued advances in the high priced shares, and the strength of the buying was evidenced in the rapid recovery of the dividends paid at the end of the year by the leading Far East Rand mines. New Modders, Modder Bs., Van Ryn Deeps, Government Areas and Modder Deeps all regained a good deal of their cum-div. prices on Monday morning and made further advances on Tuesday. Amongst non-dividend paying stocks Springs, which closed at 55s. 9d. at the year-end, advanced to 62s., but have since receded to 59s. 6d. and look like going better in the near future. Randfonteins, which will benefit enormously through the gold premium, have been firm at 26s., and there has been more enquiry for Pullingers. London has again been buying extensively and seems to favour Consolidated Main Reefs and T.G.M.E.s, both of which stocks have been marked up considerably. Amongst diamond ventures Crowns, on the news of finding a large stone of good quality, have advanced to 17s., and Roberts Victors have been as high as 25s., afterwards relapsing to 20s. It is understood that the company will restart washing in a few days' time. Frank Smiths keep very firm around 12s. 3d. and have been bought in influential quarters. African Oils have been weaker and have been dealt in at 18s. We continue to hear excellent reports concerning these shares and are told that the fall in price is due to the fact that "oil capital" is for the time being directed to an adjacent venture which is now being floated. Transvaal Silver and Base Metal allotments have been bought in large numbers up to 75s. There are rumours of the flotation of subsidiary companies and of the development of a very large industry on this company's properties and both the shares and options appear to be attractive purchases at rising prices. On Thursday the local market was irregular and slightly weaker, but latest advices from London are that the Kaffir market there is strong and buoyant and a further and early advance in Johannesburg quotations seems probable.

	Mon., 5th.	Tues., 6th.	Wed., 7th.	Thurs., 8th.
African Farms	17 9	17 9	17 3*	16 6
Anglo-American Corporation ...	60 0	59 0	59 0	58 6†
Apex Mines	7 0*	7 0	7 3*	7 3*
Bantjes Consolidated	5 6†	5 3†	4 6*	4 6x
Brakpan Mines	70 0*	71 0*	72 6	
Breyten Collieries	12 6†	—		
Brick & Potteries	4 0*		4 0*	4 0*
Bushveld Tins...	2 3*	2 5	2 5	2 3
Cassel Coals ...	—	30 0	30 0*	30 0*
Cinderella Consolidated	6 3*	7 6†	7 6*	8 0
City & Suburbans	8 3	8 0	7 6*	8 0*
City Deeps	63 0	62 0*	64 0	65 0†
Clydesdale Collieries	28 0		27 6*	27 6*
Consolidated Investment		30 0*		33 0x
Consolidated Langlaagtes		23 6*	24 0	24 0
Consolidated Main Reefs ...	14 9	14 3	15 0	14 9*
Consolidated Mines Selection	34 0†	32 6*	33 0	32 0*
Coronation Collieries				70 0†
Coronation Freeholds	2 4*	2 6	2 6	2 4*
Coronation Syndicates	17 6*	17 6	18 6†	17 0
Crown Diamonds	14 0	15 6	15 3	15 1½
Crown Mines	71 0	70 0*	72 0	71 6
Daggafontein Mines	20 0*	21 0	21 6	20 9
Do. Options (4 years)	2 3*	2 0*	2 0	2 1*
Durban Roodepoort Deeps	9 3*		9 6*	
East Rand Coals	2 8*	2 7	2 7	2 7
East Rand Deeps	1 3*	1 4		1 1
East Rand Props.	11 3*	11 10½	12 [illegible]	11 9
Do. Debentures	£67½*			£67½*
Eastern Gold Mines	1 6	1 3*	1 5	1 6
Ferreira Deeps			12 0	12 0*
Frank Smith Diamonds	11 0	12 3	12 3	12 2
Geduld Props.		55 6*	57 0	57 9†
Glencoe Collieries	—		5 3*	5 0*
Glynn's Lydenburgs	17 0*	20 0†	20 0†	17 0*
Government Areas	99 9	100 0	100 6	102 0
Johannesburg Board of Executors	—		35 0*	35 0*
Jupiters	6 9*	6 9	6 9*	6 6*
Klerksdorp Props.	2 1*		2 3	

*Buyers. †Sellers. xEx London. ʀOdd lots.

	Mon., 5th.	Tues., 6th.	Wed., 7th.	Thurs., 8th.
Knight Centrals	7 3	7 5	7 4	7 1
Knights Deeps	10 6	10 6*	10 6	9 9*
Lace Props.	18 6*	19 0	19 9	19 6
Leeuwpoort Tins	30 6	32 0	31 0	30 0
Luipaardsvlei Estates	7 0†	—	—	—
Lydenburg Farms	8 6	8 6	8 5*	8 5
Meyer & Charltons	—		—	80 0*
Modder B's	179 0	178 0*	179 0	178 0
Modder Deeps	54 0	55 3	55 3	54 6
Modder Easts	30 7½	31 3	30 10½	31 0
Do. Options (3 years) ...	10 9	11 3	10 9*	11 0
Do. Options (4 years)	13 1½	13 3	13 0	13 0
African & European Investment	17 6*	—	17 6	
General Mining & Finance	—	—	10 0†	10 0†
Hume Pipes	22 0*	22 0	22 0	22 0*
National Banks	£14¾	£14¾†	£14¾†	£14¾†
New Boksburgs	—	2 0*	—	2 0*
New Eland Diamonds	82 6*	85 6*	87 0†	—
New Era Consolidated	—	10 0*	10 0*	10 0*
New Geduld Deeps	2 5*	2 3*	2 3*	2 3
New Heriots	9 6	9 6*	10 0	10 6*
New Kleinfonteins	13 4	13 9	13 9	13 9
New Modders	£34*	£34½	£34¼*	£34¾x
New Primrose	2 3*	3 3*	3 9*	—
New Unifieds	6 6†	6 6†	5 9†	6 0†
New State Areas	29 6	29 0	29 0	28 6
Nigels	6 6*	6 6*	6 6*	—
Nourse Mines	15 6	15 3*	15 3	14 6*
Pretoria Cements ...	97 6	99 6	100 0	99 6*
Princess Estates	3 0*	3 0	3 0	3 6†
Rand Collieries	3 9*	3 9*	3 11*	3 11*
Rand Mines	80 0†			73 6*
Rand Nucleus	2 0*		2 3	2 3*
Rand Selection Corporation	108 9	110 0†	110 0	105 0*
Randfontein Deeps	6 3	6 3*	6 3	
Randfontein Estates	26 0	26 0	25 3	25 9
Roberts Victors	22 0*	24 0†	20 0x	21 0
Rooiberg Minerals	10 0	10 0†	9 6*	9 9
Roodepoort Uniteds	6 0†	—	6 0†	5 0*
Ryan Nigels	—	4 0		4 2*
Rouxville Diamonds	25 0	25 0	24 6*	—
Shebas		3 0†	2 0*	3 0
Simmer & Jacks	7 6	8 0†	8 0†	—
Simmer Deeps	3 3*	3 6*	3 3*	3 0*
S.A. Breweries	50 0†	—	50 0†	50 0†
S.A. Lands ...	6 9	6 7*	6 7*	6 5
Springs Mines	58 9	61 3	61 6	59 3
Sub Nigels	19 0	19 0	18 6	18 6*
Southern Van Ryns	8 9	8 6	8 6	8 3
S.A. Alkalis	25 9	25 6*	26 6	25 0*
Tweefontein Collieries ...	—	—	24 6*	24 6
Swaziland Tins	—	16 0†	—	—
Transvaal Lands	30 0†	30 0†	30 0†	23 9*
Transvaal G.M. Estates	19 0	20 6	20 6*	20 6†
Van Ryn Deeps	100 0	100 0*	100 3	100 0*
Village Deeps	15 6*	15 9	15 9	15 6*
Village Main Reefs ...	8 0†	7 6†		8 0†
Van Dyks	3 0	3 0	3 3x	3 6
West Rand Consolidated			7 6†	7 6†
Western Rand Estates	9 0	8 6x	9 4*	9 6
Witwatersrands	18 0*	18 0*	18 0*	18 0
Witwatersrand Deeps	10 6	10 0*	10 0	10 6†
Wolhuters	5 4	5 1	5 1*	5 3*
West Springs	25 3	25 0	25 0	25 0
Do. Options	9 3	9 3		9 0*
Victory Monarchs ..			40 0*	43 0
Zaaiplaats Tins	12 0	11 9	11 9*	11 3
Union 5 per cent.	£103¼	£103⅜	£103½*	£103½*

There were buyers of Union 4½ per cent. at £102 2s. 6d., and of Union 5 per cent. (taxable) at £101.

*Buyers. †Sellers. xEx London. ʀOdd lots.

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TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Belgium the First to Show in Increased Production—Oils and Colours—Timber and Building Material—Electrical Goods—Blue Building and Plaster Lime—Iron, Steel and Machinery—Commercial Exchange.

The great feature of the week is that there are definite signs of Europe waking up in regard to production. Only the other day one of the chief importers of glass was deploring the fact that he did not know where the next lot of window glass was coming from. This happened only last month, and now he states that a shipment of glass has just arrived at the coast from Belgium. This consignment obviously shows that others are coming. This opens a big vista of what Belgium used to do before the War, especially in the hardware and iron and steel goods. For example, in 1912-13 Belgium landed iron and steel into Johannesburg at £12 10s. a ton, which was sold at £1 14s. or under per 100 lbs., as compared with the British and American at 15s. Whilst all the world has been talking about more and more production with very little result, here is Belgium making an excellent start with very little noise. At all events this is a very significant feature that production has been restarted, and it means a lot to the low-grade mines as regards the future, when America is practically out of our market through the high exchanges, and according to all the cables from Britain prices seem to be advancing. This small episode of Belgium is the sure and certain forerunner of increased production in all kinds of factories, and when one country is very much in earnest in showing the way others will follow out of necessity and so make the exchanges throughout the world a little more even than they are now.

Oils, Colours and Paints.

The year 1919 has not been profitable in many cases for some merchants dealing principally in the heavy ingredients required for paint making. One firm made a profit for 1917-1918 of £2,000, whereas in 1918-1919 the balance sheet only showed a profit of £236, although the turnover was £12,000 greater. The Armistice was the chief cause, and then came the three months' strike of the builders. At the Armistice time some firms had loaded themselves up very heavily with white lead, turps and linseed oil, and a number of outside speculators held white lead, turps and linseed oil, thus causing much stock being thrown indiscriminately on the market. Therefore it often happened that prices went down here and showed an advance oversea at the same time. Prices are much the same for turps, oils and lead. Some of the usual trade circulars have not been issued this month, on account of the holidays, but circulars are expected during the coming week. There is another 10 per cent. advance in brushware, chiefly on account of the unsettled state of Russia, whence most of the bristles come. Cathedral glass has advanced 1d. per ft. in England and all prices of paint are expected to be put up on February 1st from 10 to 15 per cent. Business has resumed for jobbing and new work very well indeed, and as a general statement none of the best painters and paperhangers need be out of work. However, in this connection a case came under notice where a paperhanger quite spoilt the papering of a room with rather a delicate light-coloured paper, for which the workman had to be turned off the job, and it was difficult for a moment to get a man for what well might be termed first class paperhanging.

Timber and Building Material.

A leading broker says that deals are slightly easier, being 1s. 9d. to 1s. 10d. per ft., according to length; floorings, 9½d. to 9¾d. per ft.; ceilings, 6½d. to 6¾d. per ft. Inquiries made at a timber yard did not confirm this statement, excepting that prices had not gone higher but had remained the same throughout the holidays, when naturally business was held up more or less. Roofing iron is certainly more plentiful because of new arrivals from the coast, the price being 1s. 5d. to 1s. 6d. per ft. of 24 gauge, but here the tendency is just a shade easier. There is a great scarcity of windows. At the time this remark was made a parcel of some half-dozen windows was pointed to. They measured 10 x 12 with 12 lights, and the price is now 80s. as compared with 67s. 6d. four months ago. In addition to the rise in price, the quality is not so good as the woodwork was poor with an overburden of knots, and the owner of these windows stated that the enhanced price was all on account of the cost of living. The second-hand timber and iron trade is very quiet indeed owing to the shortage of stocks, inquiries being very plentiful.

Electrical Goods.

In the electrical business there has been no great change since our last report. It may, however, be mentioned that ceiling roses, which in pre-War days sold at 2s. 3d. a dozen, have risen recently from 6s. to 25s., but few are available. One firm received 1,000 doz. the other day and disposed of the same within a week at 25s. a doz. These were Japanese, as English, Holland or American are absolutely unobtainable. Wiring and tubing are fairly good, but the latter is getting scarcer. Contrary to expectation, lamps are no dearer, although as previously reported they are being disposed of here at a cheaper rate than that ruling in England and Holland. Country and town business continues very satisfactory in view of the recent holidays, especially Kimberley and the East Rand district as far as Ermelo, whence have come some very big orders.

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Blue Building and Plaster Lime.

As was expected, the trade has fallen off slightly owing to the Christmas holidays, but the building activity appears to be reviving with the New Year. The scarcity of trucks is still very acute and is likely to continue for some time to come, for it will take a while before any effect will be felt on our railways, as any small additions to our rolling stock will soon be swallowed up on our large stretches of railway. A large lime works in the vicinity of Krugersdorp is nearing completion, which will also ease the position regarding prompt deliveries of lime. A gas-fired kiln standing about eighty feet high from the base to the top of the headgear, will burn the dolomite. The old method of feeding, such as is done on the ordinary Scotch kilns with cocopans drawn to the top of the kiln by oxen or a small winch, is done away with. The stone is hoisted to the top of the kiln by means of a mine skip, which runs on a steel headgear. The stone is then tipped into a bin which is capable of holding 150 tons, and the kiln is fed from the bin. In order for the gas fired kiln to give satisfaction, it has to be fed continuously, and a certain amount of work will have to be done throughout the night. An electrical installation is therefore also being erected. A No. 7 Krupp ball mill will do the crushing, and in addition, the plant will be supplemented by two huge rotary screens. Much credit is due to the promoters of the scheme, who have sunk an enormous amount of capital into the works, and their patience of over a year's standing should be fully rewarded in the near future. Several prominent mining men are awaiting the result of the burning of the kiln with considerable interest, as it is quite a new departure in the burning of blue hydraulic lime.

Iron and Steel and Machinery.

Business after the holidays is better, especially the demand for steel plates, some sizes being out of stock. The prices are high: 1-16, 65s. to 70s.; ⅛, 60s.; 3-16, 50s. to 55s.; thicker sizes, 42s. 6d. to 50s. The cables from England state that copper sheets and tubes have advanced 1d. 1½d. per lb. The following are the English manufacturers' quotations at 31st December f.o.b. Birkenhead: Brass tubes, £178 per ton; brass rods, £126; brass sheets, £151; copper rods, £163; tubes, £198; sheets, £164. However, in view of further advances, £12 per ton should be added to these figures. Tin plates, 28 in. x 28 in., per case of 200 lbs., 119s.; J. C. brand, 126s. The latter figures show an advance of 20s. per case within about a month and prices seem still rising. Imported mild steel, 35s. 6d. per 100 lbs.; drill steel, 7½d. per lb.; tool steel, 1s. 3d. All hardware prices are hardening because speculators are out of the market and ordinary merchants are only buying sufficient for their wants. A ship, the "Mongola Prince," has just arrived from America with general cargo and mining material. This is the last shipment under the normal exchange, that is something near par, therefore any new shipments from America will come under the new exchange rates. Business is certainly less from America because of the enormous difference in the exchange, but as an agricultural dealer said, we cannot discontinue all business because we are running American and Canadian standardised ploughs, cultivators, harvesters, and other agricultural machinery.

Commercial Exchange.

Business has quite picked up, as the mines are buying rather freely, but nothing of outstanding importance, as a buyer was heard to remark that they did not intend laying in more than their immediate requirements because it was anticipated that some reductions in freight were likely to take place within the next few months. There was a fair demand from outside sources but nothing of any great importance, but they were certainly better than last month. The engineering shops are only busy in places, as some firms have got rid of a few men on account of the great cost of the work; therefore only urgent jobs are placed. However, it is hoped that this will pick up as soon as the holiday zone is really over.

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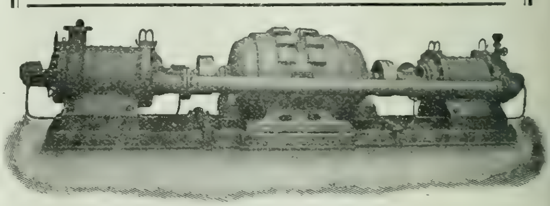

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Company Meetings.

VAN RYN GOLD MINES ESTATE.

The 24th ordinary general metting of the Van Ryn Gold Mines Estate, Ltd., was held on December 10 at Winchester House, E.C., Mr. L. B. Burns (the chairman) presiding.

The Secretary (Mr. T. Frederick Thorne) read the notice and the auditors' report.

The Chairman first referred to the loss which the company had sustained by the death of the late chairman, Mr. F. A. Gillam, adding that it was not proposed to fill the vacancy on the Board. Proceeding, he said :—The only figure in the accounts which seems to me to require any elucidation is the item in the profit and loss account, "Surplus on realisations of gold undervalued during the war, £5,483 19s. 8d." Under the arrangement which was made shortly after the outbreak of war with the British Government, through the Bank of England, the total product of the mine was contracted for by the Bank at the standard value of gold, less freight and insurance effected by the Government, and charged against the proceeds. The amount of such charges could not be accurately fixed at the time, but was provisionally estimated at 25s. per cent., and the valuation of the gold produced, as shown in the monthly and annual returns, was consequently reduced by that figure. The actual expenses, however, varied from time to time, and, especially towards the end of the war and for about eight months after the signing of the Armistice, the cost of freight and insurance was considerably less. Thus it happens that the various settlements of account effected with the Bank of England up to the date of the closing of our accounts for the past financial year has resulted in the balance mentioned above accruing to the company. With regard to the figure of the profit and loss account showing the actual revenue received from gold won, and the profit resulting from the company's operations, these are perfectly clear, but as they reflect a somewhat serious reduction under both these heads, they would seem to call for some remark on my part. The hope which I expressed last year—and which was fairly universally held—that the date of the signing of the Armistice marked practically the high-water mark of the difficult conditions arising out of the War has not been fulfilled. It is inevitable that the ravages of a war such as the world has just experienced must take years to repair, but I certainly did hope, and I was by no means alone in this respect, that conditions would from that time begin to show a steady if gradual improvement. Unfortunately, this has not been so.

LABOURS' DEMANDS.

Since then, in my humble opinion, labour, all the world over, in its continued fight for its own immediate and material benefit, seems to have lost sight of the noblest ideal which can be set up to-day as being the aim to which every one's efforts should be directed, namely, the reparation of the havoc caused by the war. Labour's task in this work should be unremitting effort to ensure the maximum of production, but the tendency seems to be towards aims which conflict entirely with this. I know that it is easy to talk about an ideal like this, but not easy to enlist the individual to adopt it and endeavour to carry it into effect if he feels that he is making a personal sacrifice that is not being equally borne by the other members of the community. I fear that the feeling to-day is everybody for himself and the country can "go hang." However, this labour unrest and continued demand for higher and higher wages has had its effect on the operations of your company, both directly and indirectly. Every time this demand is complied with by the employers in this country the price of all kinds of mining materials and stores goes up, and it is difficult to see where this is going to end so long as the artisan cannot be made to see the danger underlying it. He forces the Government and employers to pay a level of wages which is stifling industrial progress and increasing the cost of living, and then demands that the Government shall take immediate steps to reduce this high cost, refusing to see that it is to a large extent attributable to the series of strikes and demands for higher wages on the part of the working man himself which the country has had to face during the past twelve months.

SHORTAGE OF NATIVE LABOUR.

You will have seen from the remarks of your managing director that one of the most serious difficulties which the mines have had to face during the past year has been the grave shortage of native labour. This factor was referred to at some length last year, but the trouble has since become accentuated. Sir George Albu states that this shortage of native labour has had a direct effect on the grade of the ore milled by reason of the difficulty which the management has had in carrying out a normal level of sorting. The economical percentage of waste rock which should be discarded from the ore from the Van Ryn before it goes through the mill is about 10 per cent., although the average for the past year or two has, owing to the shortage of native labour, been from 7 per cent. to 8 per cent. During last year, however, it was necessary to reduce still further this percentage to 3.35 per cent. The recruitment of native labour for the mines has been seriously handicapped by the restrictions which the Government have imposed by prohibiting recruiting north of latitude 22 south; but I am pleased to be able to inform you that as the result of evidence submitted to the Low Grade Mines Commission at present sitting at Johannesburg, as to the beneficial effect of Dr. Lister's pneumococcal vaccine, that Commission, in its interim report, has strongly recommended the Government to remove these restrictions. The proof of the decreased mortality from pneumonia due to this vaccine is so overwhelming that it is anticipated the embargo on recruiting from tropical areas will shortly be removed. Sir George Albu refers to another serious factor in connection with the future of the mining industry and the maintenance of the production of gold which is so essential to the stabilising of our exchange. I mean the new Miners' Phthisis Act, which has recently come into force in the Transvaal. It would appear that this measure, which seems to have been rushed through the House of Assembly practically in one day, was based upon estimates of probable cost to the industry which had been prepared by officials, who admited that they had had no actuarial experience, and which were, unfortunately, not submitted to the Government Actuary for his confirmation. The total estimated outlay on the part of the mines for the first five years was stated by the Minister introducing the Bill to be £2,750,000, whereas, according to the evidence given recently by the Government Actuary before the Low Grade Mines Commission, the actual liability on the mines for the period mentioned is now estimated at £5,100,000. The effect in our own case is, as your managing director points out, that for the current year our mine will have to shoulder a contribution of nearly £15,000 to the fund, with the probability of a similar annual assessment during each of the succeeding four years. This compares with annual contributions of about £2,500 under the old Act. Although Sir George Albu's comments are worded in rather strong language, I have no hesitation in endorsing his criticisms of the method of the new Act, both as regards the excessive scale of compensation and the fact that the mines—or, in other words, the shareholders—are compelled to bear the sole burden of it. I need scarcely add that in these comments on the methods of the new Act we are in fullest sympathy with the principle of this compensation enactment, and share to the full our managing director's sympathies with all sufferers from miners' phthisis.

PREMIUM ON GOLD.

As a compensating factor in the general outlook for the South African mining industry, I would refer you to the paragraph in the directors' report under the heading of "Realisation of Gold." As from the 24th July last the restrictions imposed by the agreement with the Bank of England during the War were removed, and the mining industry is free to dispose of its gold in the best market. Owing to the great demand for gold from abroad on account of the prevailing low rate of English exchange, the additional profits now being realised by the company by the disposal of its gold at a premium are considerable. The latest realisations show that up to 106s. per ounce has been obtained, as against the fine gold value of 85s., which represents a premium of nearly 25 per cent. How long this condition of affairs will continue I cannot say; but it seems probable that for a considerable time to come we shall be able to dispose of our gold at a price which will show a very substantial increase in our revenue and profit. To show the effect of what I have said on the profits of the company I will give you this illustration. Last year the company produced gold of the value of slightly over £400,000, and made a net profit of £53,000. Had the premium now ruling then prevailed this profit would have been increased to one of £153,000. In the published profits for the current half-year no account has been taken of the additional revenue from this source, as under the new arrangement the division of this revenue can only be made at periodical intervals after actual realisation of the gold. In view of the fact, however, that the estimated profit resulting therefrom is at least equal to that shown in our published monthly returns I am pleased to inform you that at a meeting held this morning the Board decided to declare an interim dividend of 7½ per cent., or 1s. 6d. per share, free of income tax, as compared with the previous distribution of 5 per cent. (Applause.) The Chairman concluded by moving the adoption of the report and accounts.

Mr. Leopold Albu seconded the motion, which was carried unanimously.

The retiring directors and auditors were re-elected, and a vote of thanks to the chairman, directors and staff concluded the proceedings.

VAN RYN GOLD MINES ESTATE, LIMITED.

REPORT OF DIRECTORS

Submitted at the Twenty-fourth Ordinary General Meeting of Shareholders, held at Winchester House, London, E.C.2, on Wednesday, the 10th day of December, 1919, at 12 o'clock noon.

The Directors beg to present their Twenty fourth Annual Report, together with the Balance Sheet as at the 30th of June, 1919, and the Profit and Loss Account for the twelve months ended that date, accompanied by the Reports of the Managing Director and Manager, on the operations at the mine during the same period.

PROFIT AND LOSS.

	£	s.	d.
The net profit for the year from all sources amounted to … … … … … …	53,130	2	11
To this must be added:—			
Balance brought forward from the previous year … … … … … … … …	34,710	1	2
Making a total available profit of … …	£87,840	4	1
Which has been appropriated as follows: Written off for depreciation, £178 13s. 9d.; In payment of—Dividend No. 30, £25,000; Dividend No. 31, £25,000…	50,178	13	9
Leaving a balance to be carried forward to the current year of … … … … …	£37.661	10	4

During the year the mill, with accessory tube mills, crushed 400,860 tons of ore, yielding 96,477·41 ozs. of gold, of the value of £402,785 19s., equivalent to a recovery of £1 0s. 1·153d. per ton treated. Working costs amounted to £341,022 11s. 11d., or 17s. 0·175d. per ton, leaving a working profit of £61,763 7s. 1d., or 3s. 0·978d. per ton.

A comparison with last year's results shows a reduction of 9,440 tons in the quantity of ore treated, and of £57,963 2s. 10d. in the value of the gold won, equal to 2s. 4·356d. per ton. On the other hand, the working costs show an increase of 2·578d. per ton, resulting in a decrease in the mining profit of £54,337 8s. 11d.

Apart from the gradual reduction in the value of the ore treated from your mine during the past few years, the reason for which was fully explained by the Managing Director in his Report for last year, his report for the period now under review demonstrates the difficulties under which operations have been carried on. The chief of these has been the shortage of native labour, which has prevented a sufficient tonnage being mined to permit of normal sorting. It will be seen that, instead of last year's average of 7·05 per cent. poor rock being discarded, the figure of 3·35 per cent. only could be maintained.

DIVIDENDS.

With reference to the dividends paid in respect of the financial year, it will be noted that the final one was free of income tax, which represents an increase of 3s. 6d in the £ as compared with the interim dividend No. 30.

The usual list of dividends paid since the inception of the Company, amounting to £2,632,000, will be found in an annexure to this Report.

ORE RESERVES.

The payable ore reserves at the 30th of June last show 1,287,520 tons of fully developed ore of an average value of 5·7 dwts. per ton, which represents a decrease of 60,396 tons in quantity, but an increase of 0·1 dwt. per ton in value, as compared with the position at the close of the previous financial year. The Managing Director explains that the decreased tonnage and the increased value are both due to the fact that narrower stoping widths were taken in arriving at these estimates. He also points out that a considerable quantity of payable ore will, in addition, be rendered available from reclamation work resulting from the sand filling operations now in progress.

As heretofore, no credit appears in the Balance Sheet for these reserves, the cost of which has been met out of past protfis.

CAPITAL EXPENDITURE.

The Capital Expenditure has been of a negligible quantity, amounting to only £76 8s. 3d. for the period.

REALIZATION OF GOLD.

The Agreement with the Bank of England, under which the British Government purchased the whole of the production of South African gold during the war, terminated on the 24th July last. Under that arrangement the mines received only the standard value for their gold, although a premium was, in fact, obtainable. In addition, the mines had to pay considerably more for freight and insurance than before the war. Under a new arrangement with the Bank of England the mines are free to sell their gold in the best market, and are now disposing of it at a premium of at least 15 per cent. over the standard price. On the basis of last year's output the increased revenue from this source, provided this premium is maintained, represents about 12 per cent. on the capital of the Company.

DIRECTORS.

The Board desires to express its deepest regret at the death, which occurred in April last, of your late Chairman, Mr. F. A. Gillam. Mr. Gillam was a Director of the Company continuously since its incorporation in 1894, and was for very many years its Chairman, until about a year ago, when his health necessitated his relinquishing that office.

Under the Articles of Association Messrs. L. B. Burns and Jacob Freudenthal retire, and, being eligible, offer themselves for re-election.

AUDITORS.

Messrs. Deloitte, Plender, Griffiths & Co., the Auditors, retire in accordance with the Articles of Association, and, being eligible, offer themselves for re-election

GENERAL.

Your Directors desire to draw the special attention of Shareholders to the remarks of your Managing Director on the subject of the heavy taxation imposed on the Mining Industry in South Africa. Sir George Albu makes special reference to the assessment under the new Miners' Phthisis Act, and, keenly sympathetic as he is with all forms of suffering and incidentally with those under the terrible scourge of Tuberculosis, points out that the amount of compensation provided under the new Act is far beyond that legislated for in any other country. The main point of his criticism is, however, that the fund is not contributed to either by the workmen or by the Government, the Mining Industry alone being obliged to bear the enormous burden thus occasioned. Your Directors endorse the remarks of Sir George Albu, and trust that the South African Government will introduce such legislation as will afford the mines some measure of relief from a policy the effect of which, if continued, may easily result in the closing down of many of the low-grade properties.

L. B. BURNS, Chairman.
T. FREDK. THORNE, Secretary.

63/4, Winchester House,
Old Broad Street,
London, E.C.2,
12th November, 1919.

APPROPRIATION ACCOUNT.

Dr.	£	s.	d.	Cr.	£	s.	d.
To Amounts written off … … … … … …	£178	13	9	By Balance at 30th June, 1918 … … …	£34,710	1	2
,, Dividends—				,, Balance from Profit and Loss Account	53,130	2	11
No. 30 (5 per cent.) declared 11th December, 1918 … … … … … …	25,000	0	0				
No. 31 5 (per cent.) declared 18th June, 1919 … … …	25,000	0	0				
,, Balance to Balance Sheet … … … …	37,661	10	4				
	£87,840	4	1		£87,840	4	1

THE

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AND
Engineering Journal

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South African Mines, Commerce and Industries.
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Notes and News.

The Big Winders for Randfontein.

Some slight inaccuracies crept in to the recent account in our columns and in those of our contemporary, *The S.A. Engineer and Electrical Review*, of the contract placed by the Randfontein Central for the large winding engines for the deep level shafts. It should be made clear that the contract for the mechanical parts of the two winders was placed with Messrs. Blane & Co., Ltd., of Johannesburg, the makers being Messrs. Fullerton, Hodgart, & Barclay, Ltd., of Paisley.

* * * *

A £3,000,000 Engineering Combine.

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* * * *

The Rhodesian Strike Settled.

The whole mining industry of Southern Rhodesia is again in full swing, and under conditions which promise a lasting industrial peace. The Globe and Phoenix schedule confirms the justice of a locally-effected arrangement between a management whose past actions have inspired confidence on the part of the men and workers who understand the local conditions, says the *Bulawayo Chronicle*. These conditions at the Globe and Phoenix, as on some other mines, include very favourable residential arrangements for the workers. When it is remembered that the married men get free light, water and sanitary services, the very small rent charged is practically equal to their living on their own freeholds. These are matters not always considered when the position of the miners is compared with that of workers in town. We congratulate the managements of the Globe and Phoenix, Gold Fields, Rezende and the Wankie Colliery, and the workers on the respective properties, upon the honourable and satisfactory understanding that has been reached.

* * * *

S.A. Diamond Corporation.

Describing the interests of the S.A. Diamond Corporation at the annual meeting the other day, Mr. Bernard Oppenheimer said: "We have permanent interests in the diamond market; we are largely interested in the alluvial diamond fields of South Africa. We have a large shareholding in the New Vaal River Estates, in Blaauwbosch Diamond Mines, in Pniels Diamond Mines, in New Thor Diamond Mines, and several other concerns which are being developed by us, and on which our engineers give us very favourable reports and show good indications of becoming profit-earners. In addition to our diamond interests we have a substantial interest on ground-floor terms in the Anglo-American Corporation; we have also acquired on favourable terms an interest in the Daggafontein Mines, Ltd. We hold other important interests in the Far Eastern Rand. We are also large holders in Rand Selections and Brakpan and Springs Mines. We are actively engaged in securing other properties for you which we think will be profit-bearing, and I may mention, in conclusion, that our profits up to the date of our meeting entitle me to tell you that your next dividend of 50 per cent. is more than assured even on your increased capital of £300,000, and not taking into consideration any profits that you may earn on your new interest in the diamond cutting concern."

A Coal Correction.

In our issue of the 22nd November last we stated that boring had been in progress on the farm Sterkfontein, "which is owned by the Transvaal Anthracite Colliery." We learn from Mr. J. G. Howard, the proprietor of the latter colliery, that these statements are incorrect. Sterkfontein is not owned by the Transvaal Anthracite Colliery, and Mr. Howard merely visited the farm to report on it for some other interested parties.

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New Lisbon-Berlyn.

The report of New Lisbon-Berlyn, Ltd., for the year ended 30th September, 1919, states that the net expenditure during the year has amounted to £839, apart from the interest, the amount of which has been added to the loan. The funds necessary, as far as they were not covered by revenue, have, as in previous years, been advanced by the H. E. Proprietary (New), Ltd. No mining work has been done on the property during the year, the ore reserves opened up in the mine remaining, as previously stated, at 103,0 tons, assaying 7.56 dwts in gold and 0.347 in copper, together with a small amount of silver. The revenue to be expected from the treatment of this tonnage, and from the undeveloped ore in the mine, will be favourably affected when a new treatment plant is erected, by the premium on gold likely to be obtainable in the future. The grazing rights over the company's farms have again been let at a good rental. The value of the company's land, about 27,000 acres, has considerably appreciated of late owing to the general advance in the price of landed property in South Africa.

* * * *

The Record Price of Lead.

Lead continues to be marked up, and prices remain on a record level. The latest report from London, that of Messrs. G. Cawson & Co., is as follows:—The trend of the market throughout the week has been constantly upwards, culminating in the unprecedented prices being paid of £40 2s. 6d. for December and £40 5s. to £40 7s. 6d. for February and March. This figure is by far the highest known for more than fifty years, and is about 170 per cent. dearer than the average prices of the three years prior to the war. How much longer speculators may be disposed to operate at present high prices it is difficult to prognosticate. The present inflation seems partly to arise from the delay in delivery of lead by the Government, who have very large quantities sold, but buyers are unable to obtain the lead and thus have to operate on the market to fulfil their engagements. The positions with regard to future supplies so far shows no improvement. The rate of exchange is operating against fresh imports from America. Apparently there is more freight now offering from Australia, and this will tend to help the situation. The position in Spain is difficult to understand—we ought now to be receiving considerable shipments from that country. The high price of silver combined with almost a record price for lead must eventually cause a larger production. So far, however, there are few signs of any developments in this direction. The outlook is still obscure. Speculators, however, may still be able to drive the price higher, but it is difficult to say whether consumers will eventually take the lead off their hands, as after all consumers have to say the final word as to price. Caution in buying seems to be more than ever necessary at present inflated prices. Messrs. James & Shakespeare report that the price of English pig lead on Tuesday, December 9th, had advanced to £41 10s., an increase of 30s. for the week.

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The Van Ryn Meeting.

The death of Mr. F. A. Gillam, late chairman of Van Ryn Gold, was touchingly referred to by his successor, Mr. L. B. Burns, at the Company's meeting in mail week. Mr. Gillam resigned the position of chairman a year ago, but still hoped to do good service for the company as a member of the board, as he had done as chairman for many years past. Mr. L. B. Burns was associated with the late chairman in the London direction of the company, and upon no shoulders more appropriately could the mantle of Mr. Gillam have fallen than upon his. In the course of his address, Mr. Burns dwelt upon the improved realisation of gold, which had not, however, been translated into the accounts presented. Everyone will agree with the new chairman that the improvement, after the armistice, in general affairs has not come so quickly as expected, and his views upon the labour position should be deeply pondered by those who have their eyes upon what is the keystone of the nation's arch of prosperity. He dwelt upon the shortage of native labour, the possibility of securing a supply from the tropics in consequence of Dr. Lister's great discovery, and upon the action of the Government, which, in several respects, might have been more sympathetic to the mines than it has been. He particularly deprecated the hurried legislation which imposed upon companies the burden of the Phthisis Act. The company's gold has been realised up to 106s., as against 85s., which represents a premium of 25 per cent. In this connection, the remarks of Mr. N. Herbert Smith, a director, should be read with care. He showed that the higher the price obtained for gold, the longer the life of the mine would be, because it enabled lower-grade ore to be treated at a profit, which, under less favourable circumstances, would have been impossible. The chairman gave some striking figures bearing on the realisation of gold at present prices. The company last year produced the precious metal to a value of £400,000, and made a net profit of £53,000. That profit would have been, with a 25 per cent. premium, £153,000. At the meeting, the directors declared a dividend of 7½ per cent., or 1s. 6d. per share, free of tax. A cordial vote of thanks was passed to Sir George Albu and his staff for their admirable management of the mine, and also to "those who have helped us to win the War." Too often, at company meetings, the latter part of this resolution is forgotten.

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Safety Work at Calumet and Arizona Mines.

The Calumet and Arizona Mining Company and associated concerns have established an efficient and progressive department of safety under the directions of Thomas Cowperthwaite, safety engineer. C. L. Colburn, in the October report of the United States Bureau of Mines, gives the following account of the safety system, which, he states, requires that all superintendents, foremen, shift bosses and others who have charge of men to be members of the safety committee. This is done for two reasons—first, because the man who has charge of a piece of work should make observations regarding the conditions under which his men work, and should compel his men to exercise a reasonable amount of care; second, it invites competition between those who have charge of men. The mines at Bisbee, the smelter at Douglas and the New Cornelia are always in competition with each other in safety matters. Their safety status is determined by figuring the yearly cost of accidents as compared to the pay roll. This method invites competition between the various superintendents, who, in turn, require their foremen and shift bosses to use extra precautions to reduce their accidents to a minimum. At the New Cornelia copper mine a committee, composed of the heads of the various departments, makes a trip around the plant and mine each month and reports the defects noted. This has proved very effective, because each department head tries to find something wrong about his neighbour's department. All defects are reported to the chief inspector, who investigates them and reports to the general superintendent. A bonus of $30 is paid to the boss whose gang works 2,500 shifts without an accident requiring an employee to lay off. If a boss has 50 men he is credited with 50 shifts each day, therefore it would take him 50 days to earn the bonus. A bonus of $100 is paid to the foreman who has the best yearly record. These bonuses have considerable influence in strengthening the competitive system. Each department head works to get better results than his colleagues. The mining department pays the following bonus to the men: any man employed who works one year without losing more than 30 days (except loss of time owing to serious sickness) receives a bonus of $100 for the first year. The second year he receives $110, the third year $120, and so on until the bonus amounts to $250. This is the largest amount paid.

TOPICS OF THE WEEK.

MINERS' HOURS AND ENGINEERS' PAY.

Most people thought that the extremely generous—in some quarters regarded as far too generous—attitude of the mining companies towards their employees of late years had settled the questions of hours and pay for a considerable time to come. The week, however, has produced some sharp reminders that this is too rosy a view of the position, and that the fixed policy of certain of the Labour leaders here is, despite all the advantages they have recently won, to go on asking for more. In the case of the engineers' and fitters' union, there is a demand for a substantial increase of pay, and in regard to the miners, the Federation is continuing its absurd request for a 40-hours' week for underground men and 44 hours for surface men. In regard to both demands we are glad to see that the Chamber is making a resolute stand; and it would seem that a period is about to be put to the practice of giving way to the ever-increasing importunities of the men. The engineers seem to constitute a body of very efficient workmen as moderate and sensible as their organisation is complete. From them it is not to be expected that any breach of the present good relations on the mines will emanate. Unfortunately, so favourable a view cannot be taken of the miners' union. At its head and at the helm of the Federation are to be found Socialists of the most extreme type who, apparently, will never be satisfied till they attain the millennium. It is the business of these gentry to keep ever alive the spirit of "divine discontent" in their followers; and the mining industry must now let them know, and pretty plainly, that it has conceded the utmost possible in hours and wages. For the moment the controversy centres chiefly round the question of hours, and the Chamber has made out, to our mind, an unanswerable case to show the unreasonableness of the demand for a further reduction. Put briefly, the Chamber's contention is that (a) the reduction in the white miner's hours means a far greater decrease in those of the native worker, *i.e.*, from approximately 36 working hours to approximately 28 hours per week; and (b) that the effect of the reduction in hours already granted has been a serious drop in production. These statements are backed up with well-substantiated figures; and they are not seriously disputed by the Federation secretary, Mr. Shaw, in his emotional reply to the Chamber on the subject. Mr. Shaw's attitude is that the industry can "go hang" as long as he can claim to have squeezed something more out of it, during his term of office. Profits are nothing to him; shareholders, big men and small, are nothing to him; the threatened closing down of the poorer mines weighs nothing with him, provided he can win his way forward a little nearer to the goal of an earthly paradise! The native worker, of course, is conveniently forgotten; and the facts and figures that would appeal to an ordinary business man leave him cold. To anyone else but the present advisers of the Miners' Union, the following statement of hard facts by the Chamber of Mines could not fail to be convincing: "It must be recognised that, had it not been for the premium on gold, a very considerable proportion of the mines on these fields must necessarily have ceased operations, and any material decrease in working hours must cause such a serious increase in working costs that these mines will again, despite the premium on gold, be brought to such a position that the continuance of mining operations will be impossible. It does not require to be emphasised that any material cessation of operations on these mines must cause such hardship, not only to the employees of the companies ceasing operations, but to the members of the community generally, that the prospect can only be viewed with grave apprehension." That is the whole matter in a nutshell. The Chamber of Mines has been, as everyone knows, generous almost to the point of weakness towards the men during recent years. But the time has now come when it cannot give way any further without jeopardising the very existence of the industry. We are all in favour of peace and compromise and the avoidance of disruption that is ruinous all round. But a point comes when there is no alternative but to fight. "If we go forward we die; if we go backward we die; better go forward and die" may be at once the best and the bravest line to take in desperate emergencies. Faced with the latest extravagant demands in regard to hours, the mining industry, if it is to live, simply cannot afford to retreat any further.

Shale Oil Production.

In view of the recent African oil flotations and the letter in a recent issue on a bonus for oil, it is noteworthy that the Australian Government bonus on the production of oil from shale was referred to in the House of Representatives a short time ago, when Mr. Riley, of New South Wales, asked whether the Government was aware that the oil produced by Messrs. J. Fell & Co. at Newnes was being supplied to gas companies. He suggested that the Government should take steps to see that the bonus was properly used to encourage the production of kerosene in order to cheapen the cost of that article in Australia. The Minister for Customs, in reply, explained that when Parliament decided to pay a bonus for the production of oil it was stipulated that it was for the production of crude oil from shale. It appears that practically the whole output during the past three years has been from the Newnes mine, worked by Messrs. J. Fell & Co., who also operate the retorts and plant of the Commonwealth Oil Corporation. The quantity and value of the shale produced during the past three years were as follows: 1916, 17,425 tons, valued at £1 0s. 4·78d. per ton; 1917, 31,661 tons, valued at £1 3s. 1·17d. per ton; and 1918, 32,395 tons, valued at £1 4s. 6d. per ton. From the crude oil produced, the products obtained are confined to naphtha, benzine, sulphate of ammonia, and some lubricating oils. A small quantity of crude oil is purchased by gas companies. No figures are available regarding the quantities of the above oils produced. The production of kerosene is evidently not a commercial proposition without some Government assistance in the form of a further bonus or high protective tariff. During the past financial year bounty to the amount of £26,406 on crude shale oil produced in the Commonwealth was paid to John Fell & Co.

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Ore Treatment at Rhodesia Broken Hill.

Mr. S. J. Speak, A.R.S.M., M.I.M.M., gives an account of the lead-zinc deposits at the Rhodesia Broken Hill Mine in the current number of the *Mining Magazine*. These deposits consist on the surface of oxidised ores of lead and zinc, while boreholes have proved the existence of sulphides at depth. At present the leady portions are being smelted and the output of metallic lead is about 1,200 tons per month. The smelting plant is being extended so as to double the capacity. Mr. Speak states that the blast furnaces treat picked ore high in lead. The slags average about 19 per cent. SiO_2, 45 per cent. FeO, and 18 to 20 per cent. ZnO, and they are liquid even with 25 per cent. ZnO. The chief points of the success in treating a charge so high in zinc are the low blast pressure (about 8 ozs.) and the slow rate of smelting (about 130 tons of charge per day per furnace). The blast is supplied by fan blowers. The depth from the charging floor to the base of the crucible is 19 ft. A special top takes the smoke from the centre and feeds down the sides of the furnace. The slag runs continuously. Fine ore is sintered on hand-operated grates. Nothing worthy of the name of an ore-bedding system has as yet been inaugurated, nor any system for slag-handling, owing to the difficulties arising from the War, but these questions are now being taken in hand. Fluxes are obtained within a mile of the furnaces. The problem of extracting the zinc from the oxidised ores remains to be settled. Altogether there exists probably over a million tons of oxidised ores containing about 35 per cent. of zinc cum lead, which, owing to local conditions, will require special processes of treatment. Mr. Speak thinks that more than one method will probably have to be adopted. It is hoped, he says, to produce a certain amount of zinc oxide for sale as a pigment. It seems probable that the electrolytic method will be preferable to distilling, for water power is available for the generation of current, and the necessary acid can be made from sulphides.

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THE INDUSTRIAL SITUATION AND THE MINING HOUSES.

Sir Lionel Phillips Returns at an Opportune Moment—A Stiffening of Policy Required—The Chamber of Mines and the Reign of Conciliation—Chances Missed and Extremist Demands Conceded—The Chamber at last says "No."

The return of Sir Lionel Phillips to South Africa synchronises with the arrival of the gold mining industry of the Witwatersrand at a critical point in its career, and the present seems to be an opportune time to take stock of the general position and to endeavour to depict some of the events of the past few fateful years in their proper perspective. We may also attempt a diagnosis of some of the evils from which the mines are suffering to-day and thus indicate the directions in which more stable and satisfactory conditions may obtain. Sir Lionel brings with him an invaluable fund of experience and knowledge, and we have no hesitation in saying that he will find abundant opportunity for the employment of these qualities not only in securing more efficient administration in his own corporation, but in regard to the Rand as a whole. Since Sir Lionel left these shores much water has flowed under the bridge of industry. We have seen the Corner House, with which he has for so long been intimately connected, maintain its position as the premier gold producing corporation of the world, and as such it has necessarily had a dominant influence in the councils of the whole gold field, an influence expressed through the medium of the Chamber of Mines, of which institution Sir Evelyn Wallers has been President for the past five years.

The Reign of the Peace Maker.

We hardly think that administrative records either of the whole industry or of the premier mining corporation of that industry have been matters for much congratulation during the period of Sir Lionel's absence. To take the broader aspect of this question first, it must be borne in mind that had it not been for the selling of gold at a premium, which is a blessing that has fallen upon the Reef like manna from heaven, a large number of the mines would have had to close down. Even now the position is precarious at many properties. Working costs are steadily rising. In 1914 the cost of mining and treating a ton of ore was 17s. 1d. In November last it had risen to 23s. 5d., and last month it was substantially higher. Costs of commodities and of labour are increasing all the world over, and the selling of gold at a price 23 per cent. above its old time standard value is not calculated to create a tendency towards a decrease either in the price of material or the wages of labour. But the principal factor in this rise of costs has been the increased wages paid to labour resulting from a weak policy and the "vicious circle," as Sir Evelyn Wallers calls it, of the rising prices of commodities, coupled with a reduction in working hours. Contrary to labour's prophecies, efficiency has not increased with the reduction of hours in the working shift. On the contrary, it has decreased. We believe that statistics clearly show that since shorter working hours were conceded some time ago efficiency has declined by 25 per cent., and it is high time that the industry said "No," and meant "No," to demands for the further shortening of the working day.

The Day of the International Socialist.

We do not believe that the majority of workers along the Reef desire to force employers into a position which will inevitably mean closing down and unemployment; neither do we believe that the continuance of the policy of conciliation with extremists can possibly be in the interests of the country at large, which derives so great a part of its revenue from the mining industry. It is, we think, regret-

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table that the nominal leaders of industry did not seize the excellent chance which presented itself a few weeks ago at the Simmer Deep, when a split in the ranks of labour might easily have been created and a definite distinction been made between the genuine Trades Unionist and the Bolshevist Extremists, who have, apparently, gained a certain following amongst the workers. Those in command at the Chamber of Mines, however, threw away that opportunity. This policy of weakness is quite consistent with the action of the Chamber in allowing time offices on the mines to collect funds for the Federation of Trades. Were the leaders of the Federation of Trades less Bolshevist in their policies, such permission might be understandable, but having regard to the anarchical tendencies of these leaders we cannot but think the authorisation of collection of Trades Unionist funds on the mines by the mining companies is an appalling piece of weakness. In effect it means that the Chamber of Mines is simply helping the extremists to gather stones which will be thrown at the industry whenever labour feels so disposed.

At the moment, however, the outstanding feature is the fact that the Chamber of Mines has at last said "No" to demands and has given a reply to Mr. Shaw, the assistant secretary of the Federation of Trades, which makes it clear that it can concede these extremists' demands no longer. We say "extremist" advisedly, for it is the voice of the International Socialist and the War-on-Warite, and not the voice of real labour that formulates these ultimatums.

THE FRUITS OF WEAKNESS.

The "No" that has at last been said should have been given long ago. Labour has apparently only had to ask and it was given. It is not too much to say that during the period subsequent to the cessation of hostilities until the Chamber's reply to Mr. Shaw's letter was published on Wednesday, the Chamber of Mines continually gave way to the demands of labour, and yet we have it on good authority that mine managers and other high officials were told early in the War period that whilst it was necessary to hold the peace during the War the time would come when it might be necessary for them to dig their heels into the ground and stand firm against further demands. The powers that be in the local mining world have not, however, given to their officials, and particularly their underground officials, that support which is necessary for the maintenance of the best work and efficiency in the mines. It is no secret that discipline is at an exceedingly low ebb along the Reef to-day, and that shift bosses, mine captains, and even underground managers and managers shirk the responsibility of sacking men who have been guilty of gross misconduct and insubordination. Conciliation can admittedly go far, but it can be overdone, and there are and have been many situations in which the fighting spirit of the late Sir George Farrar would have been a greater asset to the country than the peace at any cost policy recently pursued by the Chamber of Mines.

(To be continued.)

Fall of Rock at City and Suburban.

Last Sunday afternoon at four o'clock there was a fall of several thousand tons of rock in the lower levels of the City and Suburban. At the time there was an earth tremor, and the fall is attributed to this. A good many men were engaged on repair work below, and wild rumours of many deaths spread. As the men came up it was impossible to use the skip, and it became practically certain that a European named Morkel and seven natives were entombed. Rescue operations were started at once, and are continuing. Morkel was rescued about four o'clock this morning. He was found with a dead native lying across his head. Subsequently four natives were released alive, and another was found dead. Another native is still entombed, but is believed to be dead. It will take a fortnight to clear the mine.

West African Diamond Concession.

About 250 citizens of Luderitzbucht, both English and German, met last week to discuss whether and what steps should be taken to protest against the concession granted by the former German Government to the Deutsche Kolonial Gesellschaft regarding the sole mining rights of the said company in the so-called Sperrgebiet and to induce the newly-established Concession Commission at Swakopmund to deny the rights of the Deutsche Kolonial Gesellschaft, and to open the area for prospecting and pegging for the public. After various speeches had been made the following telegram was sent to the secretary of the Concession Committee:—"A meeting of several hundred German and British citizens of this town has passed a resolution that this meeting assembled protests against the concession granted on September 22 to the Deutsche Kolonial Gesellschaft regarding the sole mining rights in the closed area, the so-called Sperrgebiet. We are unanimously agreed that this concession is in direct conflict with the wishes of the people, and that the maintenance of the concession will be detrimental to the future of this Protectorate. Further, we protest against the assets of the State being given away without sufficient counter-value. We hope that the Concession Commission will carefully investigate this matter and take into account our wishes regarding the speedy opening of this closed areas. Should you so desire, we are prepared to send delegates to give verbal evidence before your Commission."

Spitzkop Gold Farms.

The report of the Spitzkop Farm Gold Company for the year ended 30th June, 1919, states that the ore crushed by the tributors, the G.H.L. Syndicate, was 10,979 tons, giving a yield of £8,742, equal to 15s. 11d. per ton. The company's royalty, including small amounts received from diggers, amounted to £1,067, a reduction of £349. This is due to the cessation of work for about three months owing to the outbreak of influenza at the end of 1918. These figures are subject, as before, to adjustment on receipt of final account sales. The agreement with the G.H.L. Syndicate has been extended for a further twelve months to 31st December, 1920, at a royalty of 17½ per cent.

A Madagascar Hydro-Electric Installation.

The "Government Gazette" of the French Colony of Madagascar publishes particulars of a scheme which has been approved for a hydro-electric installation at Tamatave. The waterfalls are situated 10 to 15 miles west of Tamatave, on the Ivondrono River. The capacity of these falls is estimated at 3,000 h.p. In addition to the municipality at Tamatave the Colony of Madagascar and dependencies will also become interested, and the water power will be available to furnish electricity for the general future needs of the colony in connection with the electrification of the railway from Tananarive to Tamatave, a distance of 229 miles, electrometallurgical and electrochemical industries, etc. The obligation of the municipality will be reduced to the installation of two groups of turbines to furnish 500 kw. of alternating current, power cables, transformers, and the distribution of water in the town of Tamatave.

MINE DEPT. EXAMS:—RECENT RESULTS.

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THE OUTLOOK FOR THE FERREIRA DEEP.

Lower Profits, Lower Tonnage Crushed and Increased Costs.

REDUCED profits are foreshadowed for the Ferreira Deep for the coming year, unless working costs can be brought down. That is the gist of the annual report of Mr. Percy Cazalet, in his annual report for the year ended September 30 last. Mr. Cazalet says:—The following figures summarise the results for the year under review compared with those of the preceding two years: Tons milled, 1916-17 586,320, 1917-18 508,200, 1918-19 414,890; recovery per ton, 1916-17 32s. 8d., 1917-18 31s. 9d., 1918-19 31s. 4d.; costs per ton, 1916-17 21s. 3d., 1917-18 23s. 5d., 1918-19 25s. 1d.; profit per ton, 1916-17 11s. 5d., 1917-18 8s. 4d., 1918-19 6s. 3d.; total profit, 1916-17 £334,000, 1917-18 £211,716, 1918-19 £129,875. The 1918-19 figures are exclusive of gold premium and £1,948 profit from accumulations. The average recovery, viz., 31s. 4d. per ton, was higher than had been anticipated owing to the clean-up at the outcrop reduction plant; the decreased profit was due to the lower tonnage crushed and a further rise in working costs. The decrease in the scale of operations was due in part to the incidence of the influenza epidemic towards the end of 1918 and the poor supply of native labour throughout the year, but chiefly to the diminished number of available stope faces. The delays to hoisting in No. 1 incline shaft have not been so serious as formerly; a severe earth tremor in November, 1918, resulted in damage to the shaft, but the work of reconstruction and excavation for the release of pressure has proceeded so satisfactorily that the shaft is now in much better condition and has been passed by the Inspector of Mines as safe for the hoisting of men. In consequence of this and the reorganisation at No. 2 shaft, it will now be possible to release the No. 2 shaft pillars between the 2nd and 6th levels for stoping. The principle of supporting the workings by reef packs has been continued, 59 per cent. of the area stoped during the year being supported in this way. The tonnage withdrawn from reef packs (129,221) in the worked out areas was practically the same as that reclaimed the previous year, but the tonnage packed (63,484) was only equal to half of that similarly treated in the former period, with the result that the total tonnage contained in reef packs has been decreased by about 65,700 tons and now amounts to approximately 241,900 tons; this estimate is certainly a conservative one. During the year crushing was discontinued at the outcrop plant, as the deep plant with slight alterations was found capable of milling all the tonnage supplied; this change facilitated a reduction of surface employees, both European and native, and a material saving in metallurgical costs due to concentration of working; the clean-up of the gold in the plant itself has been completed and the general clean-up of the surroundings of the plant is now in progress. Development has been continued in the eastern and low-grade end of the mine; although the larger portion has proved quite unpayable, the work has been fully justified by the exposure of payable leader in the neighbourhood of the Village Main Reef boundary between the 10th and 12th levels and payable pyritic footwall reef also between the same levels; development on the leader may now be said to be finished, but work will be continued to prove the extension of the payable zone on the pyritic reef. Mutually advantageous agreements, as detailed in the manager's report, have been entered into with several neighbouring mines for the working out of boundary pillars and other ore remaining in adjoining workings. The payable ore developed during the year amounted to 131,114 tons of a value of 7·6 dwts., as compared with 143,700 tons of a value of 6·6 dwts. for the previous year; the tonnage referred to above includes some of the Robinson Deep and Village Main Reef ore. The ore reserves have been re-estimated as at 30th September, 1919, and are as follow: Leader, Outcrop section, 29,120 tons, value 6·8 dwts.; Deep section, 574,760 tons, value 8·3 dwts.; South Reef, 204,000 tons, value 8·3 dwts.; total, 807,880 tons, value 8·2 dwts. These may be segregated as under: Immediately available, 487,470 tons, value 8·3 dwts.; temporarily unavailable (shaft and boundary pillars and isolated blocks), 320,410 tons, value 8·1 dwts.; total, 807,880 tons, value 8·2 dwts. The estimated stoping widths of the above reserves are 69 inches for the Leader and 56 inches for the South Reef, as compared with 72 inches and 57 inches respectively in last year's valuation. The total reserves show a decrease of 124,520 tons compared with the reserves as estimated at 30th September, 1918, due to the excess of ore stoped from the reserves over the tonnage developed. The value of the reserves at 8·2 dwts. is an increase of 0·2 dwt. on the previous year, due to the lower stope width and the increased pay limit taken, and also to the inclusion of the Robinson Deep boundary pillar. The results for the last quarter of the financial year showed a very considerable decline on the previous period, the recovery per ton was only 29s. 4d. compared with an average of 32s. per ton for the first three quarters. The stage has now been reached when there are very few high-grade stope faces available; a considerable amount of work has been done in the unpayable areas in an attempt to expose some payable ground, but in spite of the extended use of Jack Hammer machines and the consequent decrease of the stoping widths there has been very little success in this direction. The tonnage remaining in reef packs is situated for the most part in the No. 1 shaft area and is of a lower grade than the ore accumulated in the No. 2 shaft area which is now nearly exhausted, a factor which must affect the grade of ore to be mined in the future. The ground purchased from the Robinson Deep and the shaft pillars now available on No. 2 incline will help to relieve the situation, but as ore from these sources becomes available other good blocks will become exhausted, so that the scale of operations must fluctuate and a smaller working profit for the current year must be anticipated, unless the cost of working can be brought down.

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HOURS AND PAY ON THE MINES.

Federation's Reply to the Chamber of Mines—Detailed Statement from the Chamber.

With reference to the recent reply of the Chamber of Mines to the 11 demands submitted by the Industrial Federation, on behalf of the various unions concerned in the mining industry, Mr. E. Shaw, acting secretary of the Federation, in a letter to the Press, says that the demands were the result of a discussion in all societies, and met with no objection except as to their modesty. At a conference with the Chamber of Mines (he goes on) it was plainly stated that the promises made during the War of a better world in the future had not yet been fulfilled, and that the workers here, as elsewhere, were now seeking and demanding only a sample of it. He then emphasises two principles in the demands—consolidation of pay and shorter hours. The bonus system, he asserts, is a danger and a snare, and, like all such schemes, vicious to the workers as a whole. To accept the newly-named cost of living allowance, fluctuating as it was expected to do with the cost of commodities, was to put a commodity value upon human effort which could not be tolerated by the men, who would function in the world as such. Labour power could not, and must not, be allocated at a different price or compensation to one man with dependents and the other without. He goes on to hold that a flat rate increase of £2 8s. per week on present rates, exclusive of War bonus, is a claim which is not only moderate, but which might be condemned for its amenability, inasmuch as a 40 per cent. increase does not cover extra cost of living. The second demand—for a 40-hour week for all underground workers and 44-hour week for surface workers—is, he says, a plea by the workers for a greater share of social comforts of life, and a claim which cannot justly be denied them. As to the Chamber's statement that the demands of labour were irrespective of the effect upon production, it had been pointed out to the Chamber that as wage slaves they were only concerned with the price of labour, and would, as partners in the industry, be prepared to accept responsibility for more efficient production. In conclusion, Mr. Shaw points out that the first tax upon any industry should be the well-being of its employees, and he adds that the rest of the Chamber's statement is an attempt to conserve the profit-making principle, and is merely an apology for its continuance.

The Chamber's Reply.

The full text of the reply of the Chamber of Mines in regard to the miners' demand for a 40-hour week, expresses the opinion that, apart from the effect that the shortening of hours would have on the operations of the mines, a 48½-hour week, bank to bank, is not prejudicial to the health and well-being of employees, and that it can by no means be assumed that the decrease to 40 hours, even if it were practicable, would be advantageous to the welfare of employees generally. With regard to production, the letter says it must be remembered that on the Witwatersrand the real manual worker is the native, and that even when working hours are, as they are to-day, 48½ hours bank to bank per week, the natives' actual working time per week is not more than 36 hours, so that a reduction in the working hours of the European supervisor from 48½ bank to bank to 40, means a reduction in the case of the native manual worker from approximately 36 working hours per week to approximately 28. The decrease in production following the reduction in working hours from 51 to 48½, bank to bank, shows definitely that there is no prospect of any further reduction in the working hours being compensated by increase in efficiency of the manual worker, and further shows that the hours previously worked by the manual worker were not such as to cause industrial fatigue. If, therefore, the Chamber were to accede to this demand, or to any further material reduction in working hours, it must necessarily be followed by a very serious decrease in production, and consequently a large increase in working costs.

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THE ATTACK ON THE NIGEL BOARD.

"Shareholders' Protection Association" Criticism Dealt With by the London Directors.

Mr. John S. Sheldrick, a London agent of the Nigel Gold Mining Co., Ltd., in a circular to European shareholders, dated December 11, says:—As a shareholder I received yesterday a circular asking me to give my support to some gentlemen in Johannesburg who wish to remove the present directors and replace them by "sound, practical business men who will forthwith institute a live and progressive policy." It is a long circular, full of suggestions of incapacity, but the real ground of criticism seems to be that the mine was shut down when it should have continued work. If there is any other complaint sufficient to warrant shareholders summarily dismissing a board without further inquiry, I have failed to find it. Now, what was the position when the mine was closed down on January 3, 1918? And how far is the inference—to be drawn from the statement by the critics: That the company having earned a profit of £27,830 in 1917-18, therefore could have gone on working profitably—a fair one? Old shareholders will remember how the mine, after about thirty years' work, gradually exhausted shute after shute of ore, and how the directors, very astutely, pegged out for the company (they did not buy from others) the new area of about 350 claims adjoining. They will recall that the dividends—for so many years maintained at 30 per cent. per annum and above—gradually decreased, and how, after a brilliant record, the last shute in the old mine gave disappointing results, and Mr. Percy Cazalet (consulting engineer to the Central Mining group) was called in to advise. It was not to the interest of directors to close down; but with the patent fact before them that the old mine was practically worked out, that all further development had been stopped, and that the last three months' crushing had yielded £2,862 profit for October, £690 profit for November, and £228 profit for December, and that the further continuation of milling must inevitably have resulted in loss, the directors, as practical business men, had no alternative but to stop all operations. The circular makes much of the fact that on closing down there were left in the mine 51,000 tons of ore. The chairman drew attention to this in his annual address on the 1917 report. He said: "You will notice in the report that the payable ore reserves were not all extracted, some 51,000 tons of a value of 8·6 dwts. being left in the mine. It was found that this tonnage could not be advantageously mined, in consequence of only a limited number of stoping faces being available as we approached the end of the reserves, thus rendering it impracticable to get the rock out speedily enough to keep the crushing and secondary treatment plants profitably employed. The 51,000 tons, therefore, remain as a reserve to be dealt with when operations are resumed." Shareholders will readily understand that the cessation of operations by the Nigel Company was not to the advantage of groups who had recently acquired large blocks of claims adjoining our new ground and in the neighbourhood. The directors had this forcibly brought to their notice by the parties interested, and from time to time approaches have been made to the board by people who would doubtless welcome the chance to be able to use the name of the Nigel Company with its established reputation, and the ready market in its shares, in connection with their own companies. The directors of the Nigel Company the Johannesburg gentlemen propose to remove are as follow: Leonard Line, J.P. (chairman), W. J. O'Brien, O.B.E., M.L.A., J.P., G. E. Greene, J.P., G. J. Macfarlane, C.M.G., and W. J. Shaw. That is a panel of well-known, substantial, and respected South African business men, some of whom have directed the Nigel Company from its early days. I do not know whom it is proposed to substitute for them, but before giving *carte blanche* to a circularising "Association," I imagine my fellow-shareholders here would want to know. The so-called "proxy" which shareholders are invited to sign is, I would observe, in strict reality, a special power of attorney, and it is noticeable that it is not limited as to time. Before the Nigel mine was closed down, it will be remembered, the company was very heavily indebted to its bankers; but what is the position now? The board has by its final operations paid off the overdraft and every other debt; it has accumulated a fund of about £50,000; the company has a full equipment—battery, winding engines, cyanide plant, slimes plant, machine tools, houses, and every other necessary. The board needs no incentive to restart work when local conditions are suitable and when the information gathered by the work of others in the vicinity of the mine has provided indications which will enable the consulting engineers to decide on a forward mining policy. That time may come soon, and there is then an area of about 350 claims (a larger area indeed than it has taken over thirty years to work out) for exploitation. My judgment is that shareholders will prefer to leave the directors who know the local conditions, and who have faced and overcome all the difficuties of mining the somewhat "tricky" Nigel reef, to decide on the best policy, rather than to trust entirely to unknown gentlemen who have, they say, been "approached by various shareholders." The London committee has asked me to address the above remarks to you. The delay in South African cable messages (about a week each way) makes it undesirable to await the board's own reply.

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THE MODDER WEST.

A Far East Rand Proposition North of the Van Ryn—Development and Milling Policies—An Interesting Geological Problem.

During the past few years the Far East Rand area has proved itself to be the greatest and most profitable gold field on earth. It is essentially an area of extensive claim holdings, big capitals, and large milling capacities, and it is therefore somewhat surprising to find at the present time a company with 133 claims and a capital of £150,000 endeavouring to prove a reef immediately to the north of the New Kleinfontein and Van Ryn Gold Mines. These claims were prospected years ago, but no satisfactory results were obtained, and for a long while this area was considered to be ground of no value whatever from a mining point of view.

A Resuscitation.

Within recent years, however, the proposition has been re-opened and very interesting results have been secured. The further prospecting of this area was at first undertaken by a venture with which Mr. Tatham was intimately associated, but the Modder West, as it is called to-day, is a company with a capital of £150,000, and a board of directors consisting of Messrs. Hay Wilson, H. W. Sampson, M.L.A., H. Harvey, and Hugh J. Orr.

Correlation and Values.

The earlier efforts of the Modder West do not appear to have met with much more success than the endeavours of those who many years ago sought to establish the existence of a payable mine in this locality and who apparently just stepped short of making interesting discoveries. The earlier stages of resuscitation were probably hampered by too much non-technical interference, but under the ægis of the present board and the energetic and capable management of Mr. Rose-Martin, the Modder West Company has succeeded in establishing the existence of some thousands of tons of conglomerate, and moreover conglomerate which contains values sufficient to secure a fair profit if the property is worked on economical lines, as it is unquestionably being worked to-day. As we have repeatedly stated in these columns, payability is the measure of success of a mining proposition, not academic correlations with neighbouring reefs of proved dividend-earning capacity.

Complex Geology.

The present management has not put correlation in the forefront of its policy. Rather has it been the endeavour to sink on the occurrence, to prove its lateral extent, to follow values wherever they are obtained, and to demonstrate the value of the ore body by recovering its gold through the medium of a stamp battery. All the same a few remarks on the salient geological features of the proposition will not be out of place here. The association of Mr. Tatham with the Modder West in its earlier history gave rise to the christening of this occurrence of banket as the "Tatham Reef." We believe that Mr. Bleloch visited the proposition, and after applying his geological principles to the area confirmed the ore body in its baptism of the Tatham Reef, whatever that may mean. Dr. Rogers has also visited the property, but, of course, has been diplomatically silent as to its stratigraphical horizon, and we understand that Mr. F. H. P. Creswell has investigated the proposition. So much for the experts. From our own point of view we must confess that the Modder West is as puzzling a geological problem as we have come across on the Witwatersrand, and the Rand as is generally known is fairly richly endowed with problems in stratigraphy.

The series of conglomerate beds at the Modder West have an approximate east and west strike in the vicinity of the main workings, but the continuance of the ore body in a north-westerly direction has recently been indicated by a series of costeaning pits. In the main workings the strike of the reef approximates to that of the Van Ryn Estate immediately to its south, but whereas in this latter mine, and in fact over the whole Rand, the dip is to the south, the Modder West reef pitches at a high angle of inclination to the north. It is to be observed too that the sequence of strata is approximately consistent in both the Modder West and Van Ryn-Kleinfontein-Modder mines. It is with extreme diffidence that one puts forward at this juncture any geological thesis which attempts to account for the presence of this conglomerate section north of the reef worked in the Van Ryn mine. But the supposition that the Modder West ore bodies represent the northern escarpment of an eroded anticline of which the Van Ryn Company's reefs are the southern slope may possibly account for the stratigraphical conditions obtaining in the Modder West. It may also be pointed out that the Modder West claims are situated roughly midway between the big fractures at Boksburg and north of the Rand Klip area, and it may be the dynamic effect of earth movement on a large scale in these two areas has exerted great squeezing influence on the strata in the Modder West.

There are in this block of claims unmistakable evidences of contact metamorphosism on an extensive scale, and the squeezing and contortion of strata is evidenced in the clay "flucans" which have resulted from the crushing of the shales and also in the irregular strike of the conglomerate beds. It would be incorrect to describe the Modder West as a faulted proposition; no vertical or horizontal displacements of any note are to be observed, and the general impression one gains is that the strata in this block of claims have been subjected to intense pressure both from the south-west and north-east, which has resulted in a form of duplication (one might almost describe it as a concertina-ing) of strata.

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Development to Date.

The development work has been chiefly concentrated round the main shaft, from which point promising reef sections have been exposed at several points. In all it is estimated that the existence of reef matter has been established over a length of 1,100 feet, and the management estimates that the ore available for stoping amounts to 2,000 tons accumulated at surface and 6,000 tons in the mine. This tonnage, it is estimated, will yield not less than 5 dwts. per ton over the plates.

A Reef Section

A section across the formation from south to north, showing the conglomerate beds developed up to the early part of last month, is as under:

Shale footwall.
" A " series of reef bands.
A 1 reef, 3 to 6 inches in width.
Value 5 to 10 dwts.
2 to 3 feet of quartzite.
A 2 Reef, 12 to 15 inches in width.
Value 5 to 70 dwts.
One foot quartzite.
A 3 reef, 12 inches, 5 to 106 dwts.
12 inches quartzite.
Thin talcose schist parting.
B series.
2 feet quartzite.
B 1 reef.
6 ins. reef.
Value 5 to 10 dwts.
5 ft. 6 in. quartzite.
B 2 reef.
1 ft. 6 in. reef.
Value 5 to 63 dwts.
Talcose schist band.
Quartzite.

It will be observed that there are two distinct reef sections, known as the A and B reefs respectively, and in this connection it is of much interest to observe that in the earlier days the conglomerate beds of this locality were referred to as the Van Ryn and Modderfontein Reefs respectively, although this nomenclature is not now generally employed.

Milling to Commence Shortly.

The Modder West Company has erected a ten-stamp battery of heavy (1,650 lbs. weight) design. A Blake-Marsden rock breaker is being installed and a slimes dam excavated. Both slimes and sands are being accumulated for future treatment. It is proposed to commence milling at an early date. Much interest attaches to the further development of this property. It is a venture which has left the orthodox tracts of Rand geology and struck out on its own in a section of the Rand concerning which there still remains a good deal to be learnt.

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THE 1919 AND THE DECEMBER OUTPUTS IN DETAIL.

December Lowest for the Year—Effect of Holidays, Strikes and Shortage of Native Labour—Total £35,383,974.

THE gold output for December was the lowest for the year, the causes for which were the declaration of Dingaan's Day as a holiday on pay, in addition to Christmas Day, the strike at the Simmer Deep and Jupiter, and the continued shortage of native labour. The total output was 650,191 ozs., valued at £2,761,836, the decrease being 27,779 ozs., and in value £117,998. The total output for the year was 8,330,091 ozs., of the value of £35,383,974, the decrease compared with 1918 being 90,568 ozs., and in money £384,714. The Witwatersrand in December produced 631,833 ozs., valued at £2,683,854, the decrease being 26,012 ozs., valued at £110,494. The Outside Districts produced 18,358 ozs., valued at £77,982, a decrease of 1,767 ozs., and in value £7,504. The group profits were further affected by the mines having to pay two months' additional allowance for the increased cost of living under the recent agreement with the Mine Workers' Union, and for the first time on record the Goldfields Group (in which the Simmer Deep and Jupiter are included) showed a loss, the amount being £21,083. Apart from this group, the profits of £407,569 were £223,425 less than in November. The calculations are still based on the standard price of gold, but from January the estimate of 19 per cent. premium will form the basis of calculations. The native labour employed on the gold mines totalled 166,155, an increase of 1,484 compared with November. The following are the salient figures for the month:—

Total output	650,191 ozs.
Value	£2,761,836
Decrease	27,779 ozs.
Value	£117,998
Witwatersrand	631,833 ozs.
Value	£2,683,854
Decrease	26,012 ozs.
Value	£110,494
Outside Districts	18,358
Value	£77,982
Decrease	1,767 ozs.
Value	£7,504
Stamps	8,179
Increase	30

COMPANY RETURNS.

WITWATERSRAND.

	Value. £	Increase. £	Decrease. £
Bantjes	336	59	—
City and Suburban	28,719	276	—
City Deep	98,564	—	1,916
Cons. Langlaagte	48,781	—	790
Cons. Main Reef	71,485	1,736	—
Durban Roodepoort Deep .	27,419	—	1,185
East Rand Proprietary ...	151,610	—	115
Geduld	67,734	—	718
Geldenhuis Deep	52,115	—	510
Government Areas	191,593	—	4,706
Knight Central	28,086	—	1,151
Langlaagte Estate	38,879		3,275
Modder B.	102,387		12,319
Modder Deep	98,186	4,086	—
New Heriot	13,487	—	815
New Modder	173,091	917	—
New Primrose	15,899	—	5
New Unified	11,579	471	—
Princess Estate	19,884	—	2,138
Rose Deep	49,278	—	3,037
Van Ryn Deep	108,164	—	1,257
Wolhuter	36,110	—	471
Jupiter	14,179	—	12 225
Knights Deep	57,179	—	2,311
Randfontein Central	153,326	—	1,822
Robinson Deep	67,391	—	6,504
Simmer and Jack	46,377	—	4,919
Simmer Deep	25,164	—	20,737
Witwatersrand	35,460	—	1,109
Aurora West	14,536	51	—
Meyer and Charlton	37,588	161	—
New Goch	13,584	454	—
Roodepoort United	21,621	901	—
Van Ryn Estate	31,718		208
West Rand Consolidated...	32,882	–	2,616
Crown Mines	209,626	—	23,659
Ferreira Deep	43,110	—	2,336
Nourse Mines	51,573	2,253	—
Village Deep	56,813	—	4,048
Village Main Reef	24,187	1,632	–
Wit. Deep	30,265	—	1,262
Robinson	41,097	3,008	—
Brakpan	83,370	5,199	—
Luipaardsvlei	13,525	—	1,763
Springs	67,866	—	4,159
New Kleinfontein	64,685	—	1,766
Miscellaneous	8,343	—	4,915

OUTSIDE DISTRICTS.

	Value. £	Increase. £	Decrease. £
Sub Nigel	22,607	—	1,303
Glynn's Lydenburg	4,710	—	2,248
T.G.M.E.	25,410	—	539
Barrett	981	89	—
Miscellaneous	24,274	—	3,503

GROUP PROFITS.

	Oct.	Nov.	Dec.
Central Mining	£287,003	£256,309	£162,117
Barnato	180,188	148,814	129,204
Gold Fields	19,658	10,382	*21,083
General Mining	26,667	18,557	14,334
Mines Selection	39,844	40,935	35,835
Union Corporation	77,625	71,443	66,070
	£630,985	£546,440	£407,560

* Loss.

TWO YEARS' TOTALS.

	1919.		1918.	
	Ozs.	£	Ozs.	£
January	676,059	2,871,718	714,182	3,033,653
February	636,728	2,704,647	659,759	2,802,477
March	712,379	3,025,992	696,281	2,956,614
April	694,944	2,951,936	717,099	3,046,045
May	724,995	3,079,583	741,317	3,148,915
June	702,379	2,983,515	727,696	3,091,058
July	725,497	3,081,713	736,199	3,127,174
August	706,669	3,001,739	740,210	3,144,211
September ...	698,558	2,967,287	708,206	3,008,267
October	723,722	3,074,174	679,764	2,887,455
November ...	677,970	2,879,834	658,701	2,797,983
December ...	650,191	2,761,836	641,245	2,723,836
	8,330,091	35,383,974	8,420,659	35,768,688

NATIVE LABOUR.

The native labour figures for the past two months are as follow:

	Dec.	Nov.
On gold mines	166,155	164,671
On coal mines	12,750	12,565
On diamond mines ...	1,271	1,337
	183,176	181,573

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INDUSTRIAL ENTERPRISE IN THE UNION.

Review of New Industries Springing Up in all Parts.

NEW industries of all descriptions are still springing up in all parts of the Union, remarks the General Manager of Railways in his annual report. A small diamond cutting and polishing business was started in Pretoria nearly two years ago, staffed by experts from Hatton Garden and Amsterdam. The works are being extended, additional machinery installed, and further experts engaged. A small parcel of diamonds was sent to these works from Amsterdam for recutting and repolishing, it being found that under war conditions the work could be done cheaper and better in South Africa. Another local advantage is the greater number of hours of sunshine in South Africa than in European countries.

IRON WORKS.

The production of pig-iron started at Pretoria in July, 1918. That the ore is capable of reduction has now been definitely established. The pig-iron is of good quality. Production is still on a comparatively small scale, but the extension of the works and the installation of an up-to-date steel-manufacturing plant are contemplated. It is estimated that the present site of 500 acres contains roughly 30,000,000 tons of ore. An encouraging report has been received regarding a large deposit of iron ore situate about ten miles from Navar siding on the Indwe-Maclear line. 1,701 tons of iron ore were railed from Ermelo during the year, the bulk of it to local ore reduction plants and a few samples to Europe. Iron ore has been found on native lands about four miles from Wolhuterskop, and ore in payable quantities is said to have been discovered in the Lydenburg district.

LEATHER AND TANNING.

The tanning industry has been much extended. Four additional factories have been opened at Port Elizabeth for the manufacture of leather goods, and there are extensions in the same direction at Oudtshoorn. A new boot factory has been completed at Great Brak River, where the output is rapidly increasing. There is also a tannery and boot factory at Somerset East. A boot factory at Bedford has commenced operations in conjunction with the local tannery. The tannery at Kingwilliamstown dealt with approximately 70,000 hides last year. The large military contracts have ceased, and the factories are now manufacturing for civil requirements. Leather and leather goods to the value of £39,158 were exported during 1918, an increase of £4,462 compared with the previous year and of £36,875 compared with 1913, when goods to the value of £2,283 were exported.

WATTLE BARK.

Large quantities of South African tannin are now used in the local factories. Wattle bark to the value of £287,220 was exported in 1918, an increase of £67,787 compared with 1910. The factories established for the reduction of the bark to tannin extract are doing increased business, exports of bark extract being as follow: 1916 (when export commenced), £14,930; 1917, £49,520; 1918, £124,887. The value of hides and skins exported shows an increase of £1,000,000 compared with 1910, notwithstanding the additional numbers used in local manufactories. Exports of mohair have also risen by £740,000 since 1910.

WOOLLEN MANUFACTURES.

The local woollen factories, though working to their full capacity, are unable to meet demands. Some of them have ordered additional machinery and are preparing to extend their businesses, and the estadlishment of further factories is in contemplation. In view of the high price of woollen goods and the likelihood of prices remaining at a high level for some time, South African manufactures should be well established before serious competition begins. This is essentially a South African industry, as we have the raw materials here.

Increasing quantities of South African timber are being utilised for local manufacture. Furniture-making is showing active development in several centres, and imports are diminishing and exports increasing.

MINERALS.

Gypsum is being consigned from Riverton Road to the cement factories in increasing quantities. The value of the 1918 output was £7,000. Mineral paints to the value of £1,427 were produced in 1918. The value of the tungsten output was £3,647 compared with £252 in 1916—the first recorded output. Thirty-seven tons of tungsten, valued at £5,613, were exported to Great Britain in 1918. Mica was also exported to Great Britain, Japan, and America to the value of 1,681. A large reef of iron oxide has been discovered about 18 miles from Naboomspruit Station. A mine has been opened near Argent Station, from which four to six trucks of ore are forwarded weekly for smelting. The ore is a mixture of silver, copper and lead. Iron pyrites have been forwarded from Klein Sabie Siding to be used in the manufacture of sulphur, etc. The 1918 output of iron pyrites was valued at £7,002, an increase of £2,539 compared with the 1917 figures. Production commenced in 1915, the output for that year being valued at £939.

TIN.

Tin despatched from Potgietersrust shows an increase of 183 tons compared with the previous year. The value of the tin produced in 1918 reached the record figure of £440,995, an increase of £94,979 compared with the previous year. Tin was exported to the Argentine to the value of.

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£20,700 and to Portuguese East Africa to the value of £9,345. Small consignments were also exported to South-West Africa and Japan. Tin ore and concentrates were exported as follows: Straits Settlements, £239,926; Australia, £3,600; United Kingdom, £1,391; Japan, £150; total, £245,067.

CORUNDUM.

Corundum to the value of £45,139 was exported in 1918, an increase of £11,500 over the previous year. Exports were chiefly to Great Britain, America, Japan and East Africa. Production started in 1912 with an output valued at £659. The corundum deposits of the Northern Transvaal are said to be the largest and most important in existence so far as is at present known. Corundum is available in America, and a protective tariff has been imposed against foreign corundum in order to foster the American industry. This has to some extent affected the South African output.

ASBESTOS.

Scarcity of shipping has affected the output and export of asbestos, but large quantities were, nevertheless, shipped to the United Kingdom, Australia, Japan, America, France, and East Africa, in the order named. The local supply is practically inexhaustible, and as the quality of the fibre is such that it finds a ready market in Europe there should be a considerable increase in production when freight is available. The value of the 1918 output was £54,037.

LIME.

Lime production continues to increase, the 1918 figures constituting a record. The value of the 1918 output was £158,245, an increase of £26,872 compared with the previous year. Large quantities of this traffic are now being railed to the gold mines, to Rhodesia, to the sugar estates in Natal, and to Lourenço Marques. The tonnage forwarded from Taungs station during the year was 17,904, compared with 8,934 during the previous twelve months—an increase of more than 100 per cent. An extensive deposit of pure limestone, said to contain over 7,000,000 tons, is being opened up at Taungs. 32,616 tons of lime were railed from Potgietersrust, an increase of 1,332 tons compared with the previous year.

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SALT.

The output of salt in 1918 was valued at £163,722, an increase of £53,156 over the previous year. The output would have been greater but for the disorganisation of the industry during the influenza epidemic. Considerable quantities of salt have been exported to Rhodesia, Congo, Lourenço Marques, and also to Australia and New Zealand.

MAGNESITE.

About 1,000 tons of magnesite were railed from Dickson's siding and 156 tons from Kaapmuiden to Johannesburg during the year. The 1918 output was valued at £2,184—a record production. Manganese deposits having been discovered in the Krugersdorp district, trial consignments have been railed to Vereeniging, Delmore and Johannesburg. There is a large demand for this product. The value of the 1918 output was £1,965—more than double the value of the total output from date of Union to December, 1917.

ARSENIC.

The 1918 output of arsenic was valued at £1,759. This is the first recorded output of this mineral, which occurs in gold and tin mines in the Union. Arsenic has been discovered about 12 miles from Naboomspruit Station, and a sample consignment has been forwarded to Europe for testing purposes.

NITRATES AND POTASH.

It is understood that steps are being taken to exploit extensive deposits of potassium nitrate contained in a range of hills in the Prieska and adjoining districts. The development of the undertaking will be watched with interest, as the successful exploitation of this commodity would be of inestimable benefit to agriculture, to industry, and to the country generally. Considerable business is being done in the Upington district in burning a bush called "Melkbosch," from which carbonate potash is derived. There are enormous quantities of this bush in the South-West Protectorate. Apart from the value of the product, the destruction of the plant is said to benefit the soil.

Zaaiplaats Tin.

The results for the month of December, 1919, are as follow: Mill ran 3 days; concentrating plant ran 24 days on accumulated product; concentrates won, 15 tons; estimated profit for the month, £316 1s.; capital expenditure, £401 11s. 2d.

Swaziland Tin.

The following are the results of the operations of the Swaziland Tin Company for the month of December, 1919: Concentrate recovered, 30 long tons; estimated profit (taking tin at £373 per ton), £3,931; add adjustments in respect of previous shipments, £1,742; total profit, £5,673.

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RESULTS OF NOVEMBER, 1919, SURVEY EXAMINATION.
Total Men Passed ... .. 7 (four conditional).
Our Students, Passed ... 6
Students from other coaches Passed .. .. .. Nil
We have secured the larger proportion of the Overseers' passes during 1919 and 1918. In the last (Sept.) Managers' examination we secured 50% of the total metalliferous certificates granted, and in the previous examination the larger proportion of the total passes. Write for particulars and class time table.

THE YEAR WITH THE CONSOLIDATED GOLD FIELDS.—IV.

Mining and Financial Conditions Reviewed—The Low Grade Mines' Position—Points from the Annual Reports.

The following is the continuation of the report of the Consulting Engineer of the Consolidated Goldfields for last year:—

Considerations affecting the future.—To sum up, we look forward to a slow but gradual improvement in conditions affecting mining dependent largely upon sympathetic treatment from the Government, and the extent to which, by special effort on the part of our engineering and mining staffs, we are able to improve efficiency. The immediate factors governing the possibility of continuing profitable operations on the poorer mines and enabling them to be re-established firmly as profit-earners are (a) the measure of relief, if any, the Government will concede as a result of the recommendations of the Low Grade Mines Commission, and (b) the extent and period during which the international exchange position will enable the gold producers to obtain a premium on their gold.

Witwatersrand.—Since 1914 the results for the whole of the Witwatersrand goldfields have been as follow:—

Year to July 31.	Tons of Ore Milled.	Value of Gold Produced.	No. of Natives Employed.	Dividends declared.
1914	24,828,788	£33,736,953	161,849	£7,985,437
1915	27,283,176	£35,657,879	178,729	£7,854,908
1916	28,754,982	£38,107,584	205,374	£7,407,495
1917	28,190,501	£37,775,648	191,938	£6,732,324
1918	26,013,428	£35,721,720	179,016	£6,137,369
1919	24,108,456	£34,330,014	172,719	£4,932,339

The steadily falling rate of dividend is notable as showing the effect of war conditions on the industry. It is of interest to note that the mines on the Far East Rand distributed in dividends in 1914 sums equal to just under 20 per cent. of the total dividends. For the 1919 period, while their total tonnage crushed was 27 per cent. of the total tonnage for the Witwatersrand, they paid out some 70 per cent. of the total distributed. These figures are an indication of the trend of the mining centre of gravity, and are of interest to us by reason of our Grootfontein and Sub Nigel holdings. As regards the former property, the consulting engineer is now taking steps to locate a suitable site for the sinking of a test borehole.

Industrial Development.—The development and progress of manufactures in the Union referred to in the last annual report still continues, as evidenced by the following figures showing the value of the annual output from South African factories: 1911, £17,248,834; 1915-16, £40,434,882; 1916-17, £49,457,414; 1917-18, £61,928,665.

Coincident with this development of local production there has been a considerable increase in the value of exports of raw materials, such as coal, meat and other food products, and wool and other pastoral products. The world-wide shortage of foodstuffs and manufactured commodities is largely responsible for this development. This condition of affairs has made it necessary for the country to produce as much of its own requirements as possible, and the relative remoteness of South Africa from the main centres of the War enabled it to concentrate largely on industrial production, thus creating an entirely different state of affairs to pre-War conditions.

During the year under review some attention has been devoted to the investigation of industrial enterprises in South Africa, and now with the increased scope of the new company's constitution it will be possible to proceed further in this direction. As stated by the manager in his report for last year, our available technical skill and elaborate organisation, coupled with a very efficient and complete laboratory, puts us in an excellent position to handle enterprises of this nature.

Movene Estate.—Since the date of the last report considerable progress has been made on the above estate, including a soil survey of the whole area for the plant food constituents and physical nature of the soil. Other investigations have also been carried out, regarding irrigation prospects and the progress of the developments now in hand. Although the influenza epidemic caused some delay, suitable quarters for the employees have now been erected, and about 300 acres of sugar cane, which have been planted near the Umbelusi River under irrigation, promise a high yield of sugar per acre. An equal further area has been cleared of trees and ploughed by steam-ploughs in preparation for planting, and the canal and pumping plant are in regular operation. It is anticipated that the mill, now under construction, will be producing sugar by the middle of next year, when matured cane will be available. In view of the world shortage of food products, it is anticipated that good prices will continue to be realised for sugar, and the results of the Movene pioneer enterprise promise to warrant considerable further development at a later stage.

Southern Van Ryn Reef G.M. Co., Ltd.—An amicable arrangement has been concluded with the directors of this company, by which the property is being developed as an outcrop proposition, instead of a deep level, as advocated by Mr. C. D. Leslie. As a result of this we have surrendered the technical and administrative control, and for the present our representatives have retired from the board of that company. Under these arrangements we retain options on 37,500 Southern Van Ryn shares at par up to December 31, 1919, and on 75,000 further shares at 25s. up to December 31, 1920. The period of these options has since been extended for six months in each case.

Companies Struck Off.

Pentlands Lime Company, Ltd.; The Koppiesvley Diamonds, Ltd.; The Machavie West Gold Claims Syndicate, Ltd., The Pilgrim and Sabie News, Ltd.; Hotels and Estates, Ltd.; Leudi's Band and Messina Orchestra, Ltd.; The Farmers' General Trading Company, Ltd.; Standerton Real Estate Company; National Automobile Company, Ltd.; O. Akkerman, Beperkt; Kameel Citrus Ltd.; Dawoods, Ltd.; The Rand Meat Export Company, Ltd.; Karroo Transport Syndicate, Ltd.; Premier Box and Trunk Manufacturers, Ltd.; Rufe Naylor's Patent Life Buoys, Ltd.; The South African Loan and Investment Company, Ltd.; Orient Gold Mining Company, Ltd.; African Motor Accessories Company, Ltd.

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THE POSITION OF THE CAPE COPPER MINES.

The report of the Cape Copper Company for the year ended 31st August, 1919, states that the credit balance of £4,212 brought from the previous year, after payment of the final dividend on the preference shares for that year, has been increased by a transfer of £35,966 from the income tax provision account and of £80,000 from the reserve account, making a total of £120,178. There has been a deficit on the year's working of £171,006; £673 has been set aside for taxes outside the United Kingdom, making a total of £171,679. After deducting the credit items there remains a debit balance of £51,501. The adverse conditions which prevailed during the War period, and have continued since the Armistice was signed, have occasioned the serious setback. Just prior to the removal of Government control of the copper market the price fell heavily and it continued to fall for some time thereafter. A large part of the loss incurred is to be attributed to the heavy fall in value of the stocks of copper. Owing to the abnormal position with regard to freights the year's output of ores and matte at the Cape, together with that of the previous year, still remains in stock there. The shareholders were informed by circular in May last that " in consequence of the fall in the price of copper and the prevailing abnormally high working costs, resulting in heavy loss to the company, the directors, with great reluctance, have been compelled to issue instructions for the suspension of mining operations in Cape Colony." It is the intention of the directors to test by diamond drilling the Copperberg and Carolusberg district, where detached deposits of high grade ore have been found and worked near the surface in the past. The first borehole was recently started. Smelting at the Briton Ferry works was discontinued during the latter part of the financial year owing to high rates of wages and cost of fuel. The smelting operations have continued at the Rakha Hills mines, and the refinery was started in July last. O'okiep Mine: The returns were 5,599 tons of ore of an average wet assay of 12·37 per cent. copper, compared with 7,472 tons of 11·7 per cent. ore returned in the preceding year. Exploratory work carried out in the north-eastern area of the mine has, in places, met with ore assaying from 5 to 6 per cent. copper. The acting superintendent is unable to make any reliable estimate of the ore reserves in the mine. Nahabeen South Mine: The output amounted to 19,931 tons of an average wet assay value of 4·64 per cent. copper. In the previous year the returns were 19,914 tons of 4·05 per cent. copper. The increase in the grade of the ore is due to the fact that no ore was mined from the Capping. The quantity of ore estimated to be in reserve is the same as at the close of last year, namely, 90,000 tons of 5 per cent. wet assay.

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NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Ordinary General Meeting of Shareholders in the above Company will be held in the Board Room, Stock Exchange Buildings, Fox Street, Johannesburg, on **FRIDAY, the 12th day of MARCH, 1920, at 3 p.m.**

BUSINESS:

1. To receive and consider the Balance Sheet, Statement of Profit and Loss and Directors' and Auditors' Reports for the year ended 31st December, 1919.
2. To elect two Directors in the place of Messrs. F. W. Baxter and T. E. Parkes, who retire in rotation, but who are eligible for re-election.
3. To appoint two Auditors, and to fix the remuneration for the past audit.
4. To consider the advisability of declaring a dividend.
5. To transact any other business which may be transacted at an Ordinary General Meeting, or which is brought under consideration by the Report of the Directors.

The Transfer Registers of the Company at the Head Office, 125, Stock Exchange Buildings, Johannesburg, will be closed from the 5th day of March to 26th day of March, 1920, both days inclusive.

Nominations to fill the vacant seats on the Board must be delivered in writing at the Head Office of the Company at least three clear days before the date of the meeting.

By Order of the Board.

GEO. PARKES, F.C.I.S.,
Secretary

Johannesburg, 9th January, 1920. x5

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A Bonus for Oil.

To the Editor, *S.A. Mining and Engineering Journal.*

Sir,—Kindly allow me, through the medium of your influential journal, to congratulate "Ozocerite" on his possession of a good report from an experienced mining engineer as to the probability of mineral oil on a property in the Vryheid district. Taking into consideration the immense value of oil to the country and the world in general, it is high time the Government should grant a substantial bonus to the people who are diligently searching for fuel oil, most particularly to the discoverer. We cannot get away from the fact of the Government receiving a large yearly income from the gold mining industry; why not then put aside a certain amount of this money to the further development of the country? Thanking you in anticipation.—Yours, etc.,

"RESIDENT."

10th January, 1920.

Irrigation and the Kalahari.

To the Editor, *S.A. Mining and Engineering Journal.*

Sir,—The following cable has appeared in this week's papers:

"COTTON FOR LANCASHIRE.

"LOOKING TO THE EMPIRE.

"CONFERENCE AT MANCHESTER.

"London, Tuesday.—A conference of representatives of the Lancashire Chambers of Commerce, employers' and operatives' organisations, is being held in Manchester to consider the question of the best methods of increasing cotton-growing within the Empire, in view of America's probable inability to supply England's future demands. Sir William Barton moved a resolution urging the Government to take immediate steps to advance by every means cotton-growing within the Empire. He expressed the opinion that *Mesopotamia was the most hopeful spot for Lancashire's future supplies.*—Reuter."

Now, is it so absolutely certain that Mesopotamia is this most hopeful spot? Sir William Barton has evidently not the idea that we have in South Africa regarding the Kalahari where, with the irrigation by the Angola rivers, cotton can be grown in immense quantities by white men, while the cotton plantations of Egypt, as well as those contemplated in Sudan and in Mesopotamia, are and will be worked by the native inhabitants of these countries, either alone or under supervision of a few white overseers. For the irrigation of the Sudan at Khartoum, the Imperial Government has guaranteed a loan of £7,000,000 as first instalment. Willcock's Mesopotamia scheme includes an expenditure of £20,000,000, not including the reservoirs in the Tigris and Euphrates. These reservoirs would have to be constructed in the remaining Turkish territory if the Peace Commission does not include these reservoir sites in Syria and Mesopotamia or Armenia, which is not probable. In any case, the effective catchment of these rivers will remain entirely in Asia Minor or Armenia, and Mesopotamia will be in the same position as Egypt to Abyssinia and the Kalahari to Angola. The Euphrates and its affluent Murad-Su are running through deep gorges ending at Gerger, 120 miles below the junction of these rivers. It is only above these gorges or below in the Taurus extension, west of Diarbekir, that large reservoirs seem to be possible. The effective catchment of the Tigris and Euphrates in the mountains of Asia Minor in Armenia, and on the frontier of Persia, is less than 50,000 square miles, but the snow makes the flow more perennial. The reservoir of the Euphrates will also have to supply Syria and Palestine and the hydraulic power scheme for the pumping of the water 1,700 feet to Aintab, will be established in the gorges above Gerger. The Tigris, with its 20,000 square miles catchment, will therefore, as it always has been, remain the principal source of the water supply of Mesopotamia below Bagdad. Lower Mesopotamia is an unhealthy country, with cholera in permanence. Bagdad is only 130 feet above sea level, although 300 miles from the Persian Gulf. The average temperature in July is 95 deg. F. and 55 deg. F. in January, although the country is situated between 30 and 34 deg. latitude north. In the hot season the people work two hours a day, or not at all. The population of Mesopotamia is given as 3,600,000 inhabitants. There is therefore not much room for any European colonisation. The Kalahari is nearer to the Equator, or between 21 deg. and 26 deg. lat. south, but the influence of the Antarctic current along the west coast is still pronounced. The height above sea level is 2,800 to 3,200 feet, and the average temperature in January is about 80 deg. F. and 60 deg. or less in July. The climate is therefore better than Mesopotamia and, as the native population in the whole of Bechuanaland is only 150,000, it is perfectly suitable to a white settlement on a large scale. We have also the water power of the Victoria Falls and of the Cunene to bring the water to a level of over 4,000 feet. Instead of the 20,000 square miles of the Tigris and an uncertain area of the Euphrates, we have the catchment of Cunene, Okavango

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and the Chobe of 170,000 square miles of a rainfall of 25 to 50 inches, and Zambesi above the Victoria Falls has a catchment of 140,000 square miles. Of this last a portion can also be used for the irrigation of the Kalahari. Mesopotamia is reported to be a fertile land, but so is the alluvial portion of the Kalahari, and N'Gamiland is reported by the old resident, Mr. Kayes, to be the most fertile land on the earth. With our cheap coal we can manufacture the fertilisers cheaper than anywhere else; we will even export them to Mesopotamia. As now the English cotton manufacturers begin to see that the United States of America will before long not be able to supply the raw material required for the Lancashire industry, why should not attempts be made to try to interest the Imperial Government and British capital in the irrigation of the Kalahari and its colonisation by a European population as far as possible? The natives in the north will supply the intermittent labour required in the same time as they also grow cotton on the irrigated area reserved for them. Both the white men and these natives are worthy of as much consideration as the Arabs of the Sudan and Mesopotamia, and besides, with cheap fertilisers, the Kalahari will become a new food supply country for the United Kingdom. Wheat will be possible in winter, and the wheat crop in England in 1919, in spite of all efforts made, was only 7,979,000 quarters—3,830,000,000 lbs., out of a requirement of 18,000,000,000 lbs. Meat will be scarcer in South America. With cheap winter food produced in the Kalahari, both the Western Transvaal and S.W. Africa can considerably increase their stock. The cotton and sugar will assist to make the whole concern payable. The *Kalahari* as the *new Egypt in South Africa* is therefore entitled to greater attention from the British Government and from British capital than both the Sudan and Mesopotamia.—Yours, etc.,

AUGUST KARLSON.

172 Mears Street, Pretoria,
10th January, 1920.

PERSONAL.

Mr. Isaac Lewis has returned to the Rand.

* * * *

An inaccuracy crept into our description of Mr. F. R. Ashe in our last issue, as lately Captain R.N.R. Mr. Ashe was a Lieutenant in the Royal Navy.

* * * *

Mr. Maurice Brown, the iron and steel merchant, of Main Street, who has recently visited England, France and Italy, has returned by the "Llanstephan Castle," and is expected in Johannesburg at this week-end.

* * * *

Mr. F. S. Squire, of the well-known firm of Hadfields, Ltd., Sheffield, is at present in Johannesburg. We understand that he is visiting South Africa to place the various agencies of the company in an up-to-date position with regard to latest manufacturing developments, and to put them in a position to deal more completely with the varied enterprises of the firm.

Crown Diamonds.

The result of operations at the Crown Diamond Mine for the past month (December) is as follows: No. of loads of ground washed, 7,913; No. of carats of diamonds recovered, 900; yield per 100 loads washed, 11·37. The diamonds have been valued by an independent valuator as being worth over £9,500. Arrangements have been made by the board whereby shareholders, and those interested, will have an opportunity of inspecting the diamonds, which can be seen at the company's offices.

Witwatersrand Deep.

The estimate of the results for the month of December, 1919, are as under: Tons milled, 27,300; gold recovered, 7,125·475 fine ozs.; average number of stamps running, 200; stamps running time, 19·76 days; tube mills, 5; development footage, 256 ft. The working expenditure, including head office charges, for the month is £35,008, or 25s. 8d. per ton. The estimated working revenue, based on an estimate of £5 5s. per oz. fine, is £39,350, or 28s. 10d. per ton. The estimated working profit is £4,342, or 3s. 2d. per ton. The estimate of £5 5s. per oz. is based on the latest reports received from the London office of the company regarding gold realisation. From time to time, as account sales are received, the further premium obtained from the sale of gold will be published for the information of shareholders.

Durban-Roodepoort Gold Mining.

A meeting of the members of the Durban-Roodepoort Gold Mining Company, Ltd., was held in mail week for the purpose of having an account laid before them showing the manner in which the winding up had been conducted. Mr. P. A. Molteno, one of the liquidators, who presided, said that they had been very fortunate in disposing of the bulk of the company's machinery and plant at higher prices than had been anticipated, and out of the proceeds, together with some of the assets realised on this side, they were able to repay to the shareholders in January last 10s. in the £. There had been some delay in adjusting the claims of the Union Government, but a cablegram had recently been received from the local liquidators stating that everything had been finally disposed of and all claims discharged, and they were remitting a small balance. The liquidators thus had a balance in hand of over £61,000, and they hoped to be able to distribute during January next a final dividend of 9s. 9d. in the £, making a total return of 19s. 9d. per share, a result which he thought the shareholders would consider very gratifying. Several shareholders expressed warm appreciation of the services of the liquidators, and a cordial vote of thanks was passed to them, and also the staff, by the meeting.

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Resident Engineer and Electrician.

Applications are invited for the above position from Engineers who have had previous experience in a similar capacity.

Candidates must be skilled in mechanical and electrical engineering and have experience in the operation of an electric power plant and should be familiar with the three-phase system of distribution.

The salary offered is £45 per month.

The following particulars should be given:

1. Nature of present employment.
2. Date duties can commence.
3. Copies of three testimonials.
4. Brief record of technical and practical training and experience.
5. Copies of Government and other Engineering Certificates.

Applications to reach the undersigned not later than 12 noon on Saturday, the 31st January, 1920.

Canvassing of members of the Council is forbidden on pain of disqualification.

S. F. GOCH,
Town Clerk.

Town Clerk's Office,
8th January, 1920,
Pietersburg.

THE WEEK IN THE SHAREMARKET.

A Slump on Strike Rumours—All Stocks Easier.

THE market during the past few days has been distinctly weak and dull. The promise of the New Year, when the best stocks recovered so much of their cum-dividend quotation, has not been maintained. Even New Modders have slumped to £33 10s. Modder Bs., which were 179s. at the New Year opening, have been dealt in at 165s. Van Ryn Deeps have been down to 92s. and Modder Deeps to 52s. Smaller stocks have witnessed similar depreciation and, as is always the case, weak holders have assisted the bears, and there has been general liquidation on a large scale. The slump in prices may be attributed to several causes, prominent amongst which are the further demands of labour and the fear of disagreement between employers and employees. The threatened railway strike in Europe is another factor. A further point to be considered is the final ratification of the Peace Treaty. This has a great definitive value in regard to the legal interpretation of Peace, and thus defines the period of duration of certain options—West Springs, for example. In this respect the late signature of the Protocol is rather a bull point, but it is also disclosed in the treaty that the property of enemy subjects resident in the Union will be returned to them. This latter clause is taken to mean that no further negotiations with the Custodian of Enemy Property for "German shares" are open, not in so far as shares owned by enemy subjects resident in the Union are concerned at any rate, and this factor has perhaps tended to exert a depressing influence on the stock of certain companies which had the acquisition of such shares in view. Yet another influence which has weakened stocks is probably to be found in the issue of a new oil flotation. Some brokers have sold large quantities of stocks for clients in order that they may apply for Wakkerstroom Oil shares, which are of a nominal value of 10s., and which stand in the market at 11s. 3d.—11s. 6d. At the moment of going to press the following quotations show the effect the combination of various factors has had on the best class stocks: New Modders, £33 10s. sellers; Modder Bs., 163s. 9d. buyers, 165s. sellers; State Mines, 95s.; Van Ryn Deeps, 92s.; Modder Deeps, 52s. We do not think there is much cause for alarm. It is, to our way of thinking, a bull point that the Chamber of Mines has at last said "No" to the demands of the extremists, and we hardly think that the men along the Reef will attempt to force the issue. We deal with this subject at considerable length in other portions of this issue. Diamonds have been fairly firm locally and the latest cables indicate that the diamond market is strong in London. Crown Diamonds are again in public favour, their last wash having indicated highly profitable results. Roberts Victors have been seesawing between 18s. and 22s. and Frank Smiths keep firm at from 11s. to 12s. Leeuwpoorts have been firm at 31s. Transvaal Silver and Base Metals have been slightly depressed in sympathy with the rest of the market, and African Oils have been dealt in at 17s.

	Fri., 9th.	Sat., 10th.	Mon., 12th.	Tues., 13th.	Wed., 14th.	Thurs., 15th.
African Farms	16 3	16 3	16 6	16 7½	16 3	16 0*
Anglo-Americans	59 0†	55 0	55 0*	56 6	57 0	56 6
Apex Mines	7 3*	7 0*	7 6†	7 0*	7 6†	7 0*
Bantjes Cons.	5 0†	5 0†	5 0†	4 6*	4 6*	4 6
Blaauwbosch Diamonds	—	85 0†			—	—
Brakpan Mines	—	—	—	—		72 0†
Breyten Collieries	—	9 0*	9 0*	9 0	9 6*	8 0*
Brick and Potteries	4 0*	4 0*	4 0*	4 0*	4 0*	4 0*
British South Africa		—			22 0*	23 0*
Bushveld Tins	2 3	2 0*	2 2½	2 3½	2 0	2 0*
Cassel Coals	30 0*	—	30 0	30 6*	30 0*	30 0*
Cinderella Cons.	7 9*	7 6	7 9	8 0†	8 0†	7 0*
City and Suburbans	8 0	7 10*	7 9*	7 3*	7 0*	7 3
City Deeps	63 9	63 9		64 0†	64 6†	—
Clydesdale Collieries	27 6*	27 0*	27 0	29 0†	—	29 0†
Cons. Investment	33 0*		33 0*	33 0*	33 3*	34 0*
Cons. Langlaagtes	24 0*	24 0*	24 0*	24 6†	24 0†	23 0*
Cons. Main Reefs	15 0	14 3*	14 3	14 3*	14 3	14 6
Cons. Mines Selection	32 0*		33 0†	30 0*		
Coronation Collieries	—	70 0†		70 0†	—	70 0†
Coronation Freeholds	2 6	2 5	2 6	2 4*	2 6	2 4*
Coronation Syndicates	17 0Δ	15 0*	15 0*	17 0†	—	14 0*
Crown Diamonds	15 6*	15 6	15 6	15 0	14 0	14 3
Crown Mines	70 0*	71 0*	70 0	70 0	—	70 0†
Daggafontein Mines	21 0	19 6*	19 3*	19 3	19 0	19 6
Do. Options (4 years)	2 0	2 0†	1 0*	1 0*	1 6*	1 6
East Rand Coals	2 8	2 6	—	2 6*	2 7*	—
East Rand Deeps	1 4*	1 3*	1 3*	1 5†	1 0*	1 6†
East Rand Props.	11 4½	11 0	10 9	10 6*	10 6	10 3
Eastern Golds	—	1 6*	1 6*	1 6*	—	—
Ferreira Deeps	12 0*	—	—	12 6	12 6†	—
Frank Smith Diamonds	12 0	11 9	12 0	11 9*	11 9	11 3
Geduld Props.	56 3*	55 6	54 0*	54 0	53 9	—
Glencoe Collieries	6 0*	—	—	—	—	—
Glynn's Lydenburgs	—	18 0*	18 0*	19 0†	18 0*	18 0
Government Areas	102 0	101 3	99 6	98 6	97 0	97 0
General Minings	10 0†	10 0†	10 0†	—	—	—
Hume Pipes	22 0†	22 0†	22 0†	20 6*	20 0Δ	21 0*
Jhb. Board of Executors	35 0*	35 0*	35 0*	35 0*	35 0*	35 0*
Jupiters	6 8*	6 9†	—	6 3*	6 0*	61 0
Klerksdorp Props.	—	2 1*	—	2 1*	2 1*	—
Knight Centrals	6 11*	6 9*	6 9	6 4	6 6	6 4*
Knights Deeps	9 6*	—	—	10 0*	—	—
Lace Props.	19 3*	19 0*	19 0	19 6†	18 3	18 0*
Leeuwpoort Tins	30 6	30 9*	31 6*	31 0*	31 0	30 6
Lydenburg Farms	8 4*	8 3	—		8 0*	8 0*
Middelvlei Estates	—	2 5	2 6†	2 3*	2 3	2 6†
Modder B's	176 0	172 0	170 0	169 0	165 0*	165 0
Modder Deeps	54 0	52 6*	52 9	53 3	52 3	52 3*
Modder Easts	31 1½	30 3	30 3	30 0	29 9	20 7½
Do. Options (3 years)	10 6*	10 6†	10 0	10 0†	9 0Δ	9 0*
Do. Options (4 years)	13 0	12 3	12 3	12 0	11 9	11 9
New Boksburgs	2 0	2 0*	—	2 1	2 0*	2 0*
New Eland Diamonds	87 0†	87 6†	86 0†	—	—	85 0†
New Era Cons.	10 6*	10 6*	10 6*	10 6*	10 0*	
New Geduld Deeps	2 3*	2 3*	2 5	2 3*	2 3*	2 3*
New Heriots	10 6*	10 0*	11 0†	—	9 0*	—
New Kleinfonteins	13 9	13 9	13 0*	13 3*	13 0	12 6
New Modders	£34¾	£34½*	£34¼	£35†	£34Δ	£33½
New Primrose	3 9*	3 9*	—	4 0*	—	4 0*
New Unifieds	6 0†	—	6 0†	5 0*	—	5 0*
Nigels	6 6*	6 6*	6 6*	6 6*	6 6*	6 6*
Nourse Mines	14 6*	14 0*	14 0*	13 3*	13 6*	13 3*
New States	29 0Δ	28 6	27 6*	28 0	27 9	28 0
Pretoria Cements	100 0†	97 6*	98 0*	—	97 6	98 0*
Princess Estates	2 10	—	2 9*	—	2 9*	2 9*
Rand Collieries	3 9*	4 0	4 0	—	3 11	3 9*
Rand Nucleus	2 3*	2 3*	—	2 3	2 3*	
Rand Selections	106 3	105 0	106 3	106 0†	106 0†	100 0*
Randfontein Deeps	6 3*	6 9	6 6*		6 6*	6 7½
Randfontein Estates	25 9		24 0*		24 0	23 9*
Rouxville Diamonds	23 6	24 0	24 0	23 9*	24 6*	27 0
Roberts Victors	18 6†	19 0	—	21 0	20 6	19 6
Rooiberg Minerals	9 3*	10 0	10 1½	11 0	10 6	10 0
Roodepoort Uniteds	6 0†	6 0	7 0†	6 0	5 6*	—
Ryan Nigels	4 2*	—	—	4 2*	4 2*	4 2*
Shebas	—	2 9	2 3*	2 6	2 4	2 6†
Simmer Deeps	3 3*	3 3*	3 3	3 3	3 3	3 0*
S.A. Breweries	48 0†	51 0†	51 0*	51 0†	—	—
S.A. Lands	6 5	6 4*	6 5*	6 3*	6 3*	6 5
Springs Mines	59 6	58 3	57 6	57 6	57 9	57 3*
Sub Nigels	18 0	17 4	17 3	17 9	17 6	17 6
Swaziland Tins	—	—	—	16 0†	15 0†	15 0†
Southern Van Ryns	8 3	8 3	8 3	8 0	7 9	7 9
S.A. Alkalis	25 0*	25 0	25 0	25 0Δ	25 0*	25 6*
Tudors	—	1 6	1 3*	1 3*	—	1 3*
Transvaal Lands	30 0†	23 6*	—	27 6†	27 6†	27 6†
Transvaal G.M. Estates	20 0†	20 0†	17 9	16 6*	16 0*	16 6*
Victory Monarchs	43 6	43 6	43 0*	43 6	—	43 6*
Van Ryn Deeps	100 0*	98 0*	97 0*	96 0	—	93 6*
Village Deeps		16 0†	—	16 0†	15 6†	15 0†
Village Main Reefs	—	—	8 0†	—	—	8 0†
Van Dyks	3 3	3 3	—	—	—	3 0*
West Rand Cons.	—	8 0†	8 0†	—	8 0†	8 0†
Western Rand Estates	9 9	9 6	9 3	9 0*	9 0*	9 0
Witwatersrands	18 0	—	17 6*	18 0*	18 0*	17 6*
Wit. Deeps	10 6†	10 0	10 0†	10 0	10 0	10 0*
Wolhuters	5 6	5 6†	4 9*	4 0	5 0*	5 0*
West Springs	24 6	23 9	23 6	23 9	23 9	23 7½
Do. Options	8 3	8 3	8 3*	8 3	8 3*	8 9*
Zaaiplaats Tins	11 6	11 6	12 0	12 3*	12 0*	12 7½

There were buyers of Union 5 per cent. at £103 10s., of Union 5 per cent. (taxable) at £101; and of Union 4½ per cent. at £102 5s.

*Buyers. †Sellers. ΔOdd lots. BEx London.

*Buyers. †Sellers. ΔOdd lots. BEx London

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TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Labour Demands Upsetting Business—American Business Practically Stopped—Iron and Steel—Dunswarts' Remarks—Commercial Exchange—Shortage of Material for 1920—Electrical Goods—Hume Pipe Progress—Timber and Building Material.

It so happened that the first man seen when making the usual weekly calls said that he had come into town for the purpose of placing orders with the engineering shops, but they did not seem anxious to overload themselves with work until they knew what was to happen in reference to the engineers' ballot for a strike. This feeling of unrest turned up every now and again throughout the day when making subsequent inquiries. The idea is pretty general that a give-and-take policy will no doubt harmoniously fix up matters. Perhaps the more serious question is the difficulty of getting goods, as the inquiries have greatly increased since the beginning of the year. First of all it is not easy to place mining material orders either in America or Britain. That's number one. Number two is to get anything like a definite idea as to when delivery will take place from the manufactories. Number three is the railage to the coast; and number four is the extra delay in obtaining ships, and then the further difficulty experienced in loading up. Upon arrival at our coasts there is another difficulty in getting railway trucks, so that the total represents six or seven months from placing an order and eventually receiving the goods, either from Britain or America. For example, South Africa has practically been out of the American market for two months, therefore that interval has to be made up. An indent house is offered a lot of business to-day notwithstanding the almost prohibitive exchange, but when they are told that no shipments can be guaranteed under nine months any business is off. According to the best advices the hardware manufacturers in America are overloaded with business not only for home consumption but for European countries, causing South Africa to take quite a secondary position. As regards Britain, our merchants did the wrong thing in stopping orders immediately after the Armistice and cancelling as many as they could. Now they are suffering because of the difficulty of getting orders accepted and the increase in prices. Merchants as a whole consider that 1920 will be a year of shortages, and our mining and other industries will suffer in consequence.

Iron and Steel.

The Transvaal bar iron and steel trade has been quite buoyant since the New Year holidays were over, as last week was one of the best experienced by a firm who principally deal in bar iron and steel as well as steel plates. The orders were sent throughout Johannesburg and the Reef and all parts of the Union, including the coast ports from Capetown to Delagoa Bay. Inquiry for steel plates is very persistent, and when the present small stocks are exhausted prices will advance anything up to 25 and 50 per cent.; in fact, steel plates are likely to be very scarce owing to the trouble of getting them either from Britain or America. The prices are: For shovels, 60s. to 65s. per doz., American, and 80s. English; imported mild steel and iron bars, 35s. to 45s.; brass rods and plates, 2s. 3d.; tool steel, 1s. 6d.; drill steel, 7½d.; wire nails, 6 in., 40s.; 4 in., 42s.; 3 in. and 2 in., 45s.; 1½ in. and 1 in., 60s.; picks, American and Canadian, 55s. per doz. Hoop iron or flat building iron for building, for reinforcing brick work, is very scarce indeed in the smaller sizes, and 75s. has to be paid for [illegible] and [illegible] and others 55s. per 100 lbs. The following are quotations for copper, brass and muntz metal f.o.b. New York, with probable shipment in the first quarter of 1920. Sheet copper, 30 cents; brass rods, 23 cents; copper rods, 28 cents; bare copper wire, 24 cents; muntz metal sheets, 27¾ cents; rods, 24¾ cents. Almost all the American manufacturers' mail advices state that raw material in connection with the iron and steel industry is so scarce at some places that it has seriously interfered with the progressive output.

Note from Dunswart Iron and Steel Works.—The prices of local iron and steel keep about the same. The demand is rather spasmodic, but the total of orders placed is all that the mills can fill. Few of the mines buy any large quantities, but as the imported article will be coming in at considerably advanced prices, the demand throughout the country for the locally manufactured article will increase, and the prejudice, which always exists in this country against the local article, will diminish as it is used.

Commercial Exchange.

Business has been quite good after the New Year holidays: it may slacken off now, as we are past the middle of the month. The mines are still buying fairly well and so making up for the shortage in the railway and municipal demands. The unique feature of to-day's position is that there are big inquiries from coast merchants for all kinds of mining material, construction work, and many other lines, thus showing that stocks at the coast are not so well assorted as compared with a few months ago, which is another proof that the stoppage of orders from Britain and America is making itself felt throughout South Africa. There have been some good orders from the diamond prospectors, hence the difficulty of obtaining wheelbarrows, which have advanced anything up to 5s. each during the present week, although in most of the orders the urgency is of more importance than the actual price. There is no use disguising the

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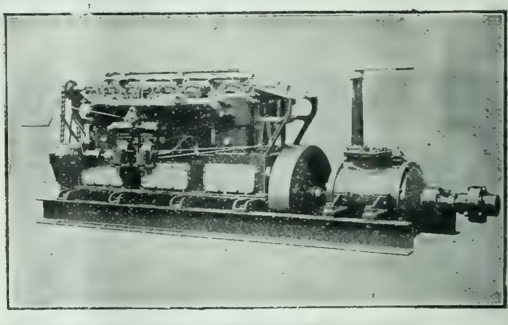

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fact that the labour unrest is taking much of the vim out of the business that was noticeable at the beginning of the month, although members of the Exchange feel that things will come right yet, but the continual upsets are certainly very disconcerting. Under the circumstances it is not surprising that capital is being held back and diverted to other channels, rather than towards new industries as was hoped for at the commencement of the New Year.

Electrical Goods.

In the electrical market there is undoubtedly a shortage in certain articles. Ceiling roses are practically *non est.* A few of the Japanese variety are on hand, but the Municipality having refused to pass them they have been left out of the running. As against this a leading merchant received the other day some 300 dozen, also Japanese, which proved very good indeed. These were disposed of within three days, and our informant said, considering the really capital quality of the goods, he wished that instead of 300 dozen there had been 300,000, as he could have sold them at the enhanced price of about 5s. C. G. holders are now selling at 16s. a dozen, which is about twice the price obtaining a few months ago. This same merchant received recently some 600 dozen C. G. holders, which he characterised as "beautiful stuff," but which lasted him only a week. This is a sufficinet pointer as to the present demand and the stocks on hand. Prices are firming up for all electrical goods. Japanese lamps are 1s. 9d. each and 20s. a dozen, but 2s. and 23s. or 24s. are the prices charged respectively for English, American or Holland lamps. Wiring and tubing are fairly plentiful. Adaptors are still very scarce. Town and country business remains satisfactory, subject to the restrictions imposed by insufficient or no stocks in certain lines.

Hume Pipe Progress.

This local industry is making really astonishing progress. During the past two months it has been found necessary to erect double shifts on both pipe making and reinforcement. In spite of this, and in spite of the fact that six machines are now running, it is impossible to cope with the orders on hand. New machinery has therefore had to be ordered, and at the present time two additional complete sets of pipe-making plants are being manufactured locally. An extensive order has just been secured for the water supply scheme at Montagu. Pipes of six feet diameter are being made this week, whilst it is an ordinarily daily occurrence for pipes of five feet diameter to be turned out. Some idea of the size of these pipes may be gathered from the fact that the six feet pipe weighs nearly four tons, whilst the five feet pipe weighs nearly three tons. A department has been opened for the manufacture of paving slabs and for the manufacture of rain water tanks, etc., This department is also fully occupied. The order books show over 300,000 feet of Hume concrete pipe actually on order at the moment. A huge company has just been floated to exploit the Hume pipes in Britain, the European Continent and America. In India a company was formed some three or four months ago and has secured a large site near Calcutta, where works are rapidly being erected.

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Baltic timber is none too plentiful. Deals are 1s. 10d. and 1s. 11d. according to length; floorings, 10d.; and ceilings, 6½d. per ft. Some yards consider that roofing iron is dearer, but the price is round about 1s. 6d. per ft. for 24 gauge. The hardwood timber trade chiefly for furniture is brisk at the following prices: Burmah teak, 30s. per cube; American oak, 1s. 6d. to 1s. 8d.; Japanese oak, 1s. 8d. to 1s. 10d.; clear pine, 1s. 9d. to 2s.; shelving, 1s. 2d. per ft; Venesta panelling, 9d. to 1s. Teak is likely to go higher owing to the exchange and the high value of the rupee. The position in the second-hand timber and roofing iron is much the same, especially as regards the dearth of material. It was noticed that one yard was fairly well supplied, but on enquiry it was found that all the timber had been disposed of. The crux of the whole matter in the building trade is the shortage of bricks for new work, therefore in many cases contractors will not sign contracts until they are assured of brick supplies. A builders' broker states that he offered 80s. for a few thousand stock bricks for immediate delivery, but so far he has failed in his endeavours. He was also in search of second-hand bricks, having been promised a quantity when certain outside walls were pulled down, but his anticipations for immediate delivery are dashed to the ground because the pulling down part has had to be postponed for several weeks because the steel girders cannot be had for some time. The broker in question is worried all day with enquiries, of which a very few only can be dealt with, simply because of the acute scarcity of bricks and in a lesser degree cement and timber.

Spencer Bay Diamonds.

The Inspector of Mines, Luderitzbucht, has granted the licence to commence work and that the necessary plant is on the ground, and washing operations will be commenced almost immediately.

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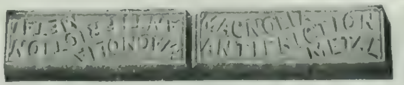

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Notes and News.

Progress of the Mint.

The discussion on the gold question has naturally re-aroused interest in the Mint, which is to be erected at Pretoria. It appears that the building will be erected on the site of the old Pretoria gaol in Koch Street and that the plans have been submitted to the Royal Mint for approval. It is feared that the machinery will take between six months and a year for delivery.

* * * *

Siemens Brothers Dynamo Works.

The English Electric Co., Ltd., of Queen's House, Kingsway, London, W.C. 2, has purchased the Stafford Works of Siemens Brothers Dynamo Works, Ltd., and in succession to the latter company, will continue manufacturing at those works as from 1st December, 1919. A working agreement has been entered into between the English Electric Co., Ltd., and Siemens Brothers & Co., Ltd., providing for the preferential exchange of the special products of each.

* * * *

Tunnelling Corps' Dinner.

A notable function took place recently when the Rand ex-Officers of the Tunnelling Corps, R.E., who had served in France, held their first annual dinner. The Chair was taken by Capt. Cobbett, who will be remembered on the Reef before the War, and who distinguished himself in France. Some fifty ex-members of this celebrated Corps sat down to dinner, and the proceedings were of the happiest description. It is intended to make the gathering an annual affair.

* * * *

Fire at the Blackhill Colliery.

A disastrous fire broke out at the Blackhill Colliery last week which resulted in the destruction of the headgear and screening plant. The headgear appears to have been struck by lightning during a storm, but all the underground employees were safely removed through the ventilation shaft. It is understood that the damage was fully covered by insurance. As we announced the other day, the Blackhill Colliery had only recently passed from the control of the Anglo-French Exploration Company to that of Sir Abe Bailey.

* * * *

Prospecting in Mandate Land.

We have received from our Windhuk correspondent copies of the map issued by the Mines Department, showing the reserved areas in the Protectorate, and of the new Mining Law as translated from the original German, with amendments. Under the new law prospecting is allowed as from January 1, 1920, but no pegging is permitted before March 1, 1920. A prospector must take out a Prospecting Licence (cost 2s. 6d.) for each district separately. Licences are issued by Magistrates, who are empowered to demand surety from the prospector for the due fulfilment of the Mining Regulations. Copies of the map and regulations are obtainable from the Government Mining Inspector, Windhuk, at a cost of 2s. 6d. and 1s. respectively.

* * * *

The Mining Exhibition.

Elsewhere in this issue we give an account of the Mining Exhibition organised by the Chemical, Metallurgical and Mining Society, which is being held in the School of Mines. The chief feature is undoubtedly the splendid display made by the "Safety First" Committee, and this affords eloquent testimony to the growth and value of this movement on the Reef. The examples of native ores and minerals are not very complete, but the exhibits of spare parts and machinery made in the mine workshops during the War is a striking tribute to the resourcefulness of Rand engineers. Lectures will be given during the coming week by Dr. Orenstein and Mr. J. D. Marquard, Deputy Inspector of Mines, and admission to both lectures and exhibition is free.

Frank Smiths.

An official notice was issued during the week to the effect that the Frank Smith scheme of reconstruction having been ratified by the English Courts, it is notified that the transfer books of the company will finally close after 24th January, and shareholders registered on that date will be entitled to apply up to 28th February, 1920, for one share of the new issue for every two at present held. A circular letter, with forms of application and letter of renunciation, will be forwarded to all such shareholders on 7th February. It is understood that Mr. van Essyen, manager of the Roodepoort United Main Reef, and formerly manager of the State Mines, has been appointed manager of the Frank Smith mine.

* * * *

An Important Industrial Issue.

The provision of capital for promising local industries proceeds apace. The company known as the South African Woollen Mills, Ltd., the makers of the famous "Waverley" blankets and tweeds, so well known throughout South Africa, is being reconstructed with a capital of £200,000. They have issued a modest prospectus offering to the public 75,000 £1 preference shares, while the whole of the ordinary shares are retained by the vendors. The produce of the company has received such support from the public that the directors of the old company have found it essential to extend their operations, and thus increase the output to meet the ever-increasing demand. Those of the public who are anxious to see that South African raw material and South African labour should be used for the furtherance of the interests of South Africa, as well as those desirous of a sound investment, have, in the prospectus now issued, an opportunity of participating in a concern which has the stamp of merit placed on it by that important institution known as the National Industrial Corporation of Africa, Ltd.; an institution which was established for the purpose of fostering sound industrial concerns in South Africa which are capable of bearing the closest investigation by their experts.

* * * *

The Embargo on Gold.

Mr. J. W. Jagger has again been giving the Capetown Chamber of Commerce his views on the embargo on gold, the removal of which, he contends, by making for a natural exchange, would reduce the cost of living. Mr. D. C. Greig, however, in a letter to the papers, deals effectually with Mr. Jagger's proposals. Mr. Greig writes: "Mr. Jagger's proposal to reduce the cost of living by removing the embargo on gold is not original, and in fact is trotted out daily as the obvious remedy by those who have a superficial knowledge of exchange or to whom the importers' interests are paramount. I dare say the majority of men whose business it is to deal in exchange would prefer a natural exchange to a conventional one, but refrain from advocating the change on account of the serious fall which would follow in our international securities, and anything we exported or was realisable in foreign markets. It would not matter whether it were New Modders or wool, the difference against the exporter at to-day's price of gold would roughly be 30 per cent. Of course, as a natural consequence, there would also be a fall in the value of land. A reduction in the cost of living which Mr. Jagger claimed as a set-off is much more difficult to calculate. It would depend so very largely on the honesty and generosity of the importers. Mr. Jagger fails, like everyone else who advocates a natural exchange, to show how the change is to be brought about. Either an embargo is on or it is off, unless Mr. Jagger has some method of his own which will prevent the sudden dislocation of all markets by its removal. Mr. Jagger does not exhibit that scrupulous care for accuracy which distinguishes the true economist. It is not the case, for instance, that Sir Evelyn Wallers advocated the introduction of an inconvertible paper currency in this country. All that he proposed was the issue of gold certificates fully backed by gold, to be converted at a date when conditions were more or less normal—an entirely different proposition."

New Heriot.

The meeting of the New Heriot Gold Mining Company for the purpose of electing London agents took place in London recently under the presidency of Mr. Francis J. Dormer. Referring to the company's immediate prospects, the chairman said it was quite impossible to forecast what the coming year would bring forth for a company like the Heriot. Whilst increased costs took vast quantities of rock out of the range of payability, any premium on gold must tend, according to its extent and its duration, to bring them back again. In the presence of such uncertain factors, it would be idle to frame an estimate as to the life of any mine on the Rand. One thing, however, was certain, that the responsible heads of the industry would, so far as in them lay and circumstances permitted, do their best to make hay while the sun shone, and the directors of the New Heriot would form no exception to the rule. They might, therefore, without undue optimism, entertain the hope that the coming year would, for this company, prove, at any rate, less unfortunate than its immediate predecessors.

* * * *

The Montrose to Restart.

The Montrose diamond mine is to be restarted. Speaking at the meeting in London the other day, Mr. Percy Marsden said: "Firm believers in the prospects of the company have supplied the necessary guarantee. The issue of capital was made, and the company is now in the position of having a sum of £30,000 as working capital, which will be available for the purpose of restarting operations. Concurrently with the installation of such plant and the conduct of the new tests, mines Nos. 1 and 3 will be unwatered, retimbered where necessary, and further driving and sinking operations proceeded with. Your board are now in negotiation with a view to obtaining a fully qualified consulting engineer, who will take charge of the mine. Shareholders are to be congratulated upon the position which has now been created. The high price of diamonds which now prevails invests our undertaking with new interest and offers an opportunity for successful development such as we have never before experienced. On previous occasions I have dwelt at some length upon the fact that the mines have never had a fair chance. Development was never fully and properly undertaken, and hence we failed to obtain from the treatment of the blue ground the full results that we were entitled to expect."

* * * *

The Nigel Affair.

There appears to be some sort of attack on the management of this company, and it is conducted by the "Shareholders' Protection Association, Ltd., of Johannesburg." They have issued a circular and that circular has apparently been sent to all the British shareholders. There are two complaints in the circular. The first is that the crushing plant was enlarged; and the second is that the mine was closed down when it ought not to have been. To support this latter complaint, they point out that on closing down there were 51,000 tons of ore, averaging 8·6 dwts. left in the mine. On these two complaints the Shareholders' Association propose to turn out, neck and crop, all the present directors and to substitute them by a board of what they call "sound, practical business men." With their circular they enclose a document which is called a proxy. An examination of this document reveals the fact that it is a special Power of Attorney, not limited, as proxies are, to one meeting specifically called, but entitling the attorney to convene meetings from time to time and for all time. It is not surprising that the London committee should think it necessary to protect their shareholders by at once answering this extraordinary claim. One of the London Committee, Mr. John S. Sheldrick, who is pretty well known to Nigel shareholders, has issued a vigorous reply to the circular, from which we printed some extracts in our last issue.

Rights of Mine Shareholders.

The statutory right of a shareholder in a mining company organised under the laws of California to examine the company's mines and to take samples of the underlying ore and to recover a penalty for refusal to permit an inspection or taking of samples was recognised by the California Supreme Court in the recent case of Symmes vs. Sierra Nevada Mining Company, 153 "Pacific Reporter," 710. "The purpose of the examination," declares the court, "is to arrive at the value of the property in which the shareholder is interested. Broadly speaking, that value is composed of two elements—the economical or uneconomical working of the mine, and the extent and richness of the ore body. One employing an expert to examine a mining property would view with amazement a report that declared there was an ore body of given dimensions, but that the expert had taken no samples, caused no assays to be made, and could place no valuation upon that ore body." The court also decides that the law applies as fully to mines owned by a California corporation in another State as to those within the State.

* * * *

Luipaardsvlei.

At the annual meeting in London of Luipaardsvlei Estate and Gold Mining Co., Ltd., important statements were made as to the gold premium now being obtained. Essentially a low-grade mine, Luipaardsvlei is one of those concerns which can appreciate to the full the improved price of gold. Since July it is calculated that an amount of over £20,000 has to be received under this head. The position would have been even better had more natives been available. At the end of October the labour supply had fallen to 1,578, or over 700 below the full complement and at least 500 below the bare requirements of the property. Fortunately the latest news from the mine indicates that an improvement may be expected early next year. The ore reserves show an increase over the previous year by 77,806 tons, bringing the total amount available up to 771,000 tons. It is interesting to note that in 1914 the ore reserves stood at 704,680 tons, and the shareholders may be congratulated on the present figure, more particularly as in the interval 240,000 tons have been crushed every year since that date. Five additional claims have been purchased for a small cash payment and good results are anticipated on development.

* * * *

The Outlook for the Shamva.

Not only the Transvaal gold mines, but also the Rhodesian mines are feeling the benefit of the big premium now ruling on the price of gold. The Shamva Mine, for instance, one of the two "show" mines of Rhodesia, announces a dividend of 5 per cent., together with a bonus of 2½ per cent., making a total distribution for the current year of 22½ per cent., which compares with 20 per cent. for 1918. This increase, however, is considered only an earnest of what is in store for the shareholders. It may be taken for granted that the mine is on a 30 per cent. dividend basis, with the premium on gold at only 10 per cent., whereas the premium is now nearer 30 per cent. The position and prospects of the mine, as reviewed by the chairman at the last meeting of shareholders on November 12th, are of a very favourable character, and the ore reserves were given as at the end of 1918 at over 2,000,000 tons, of an estimated average value of 4·3 dwts. per ton as compared with about 1,608,000 tons, of a value of 4·45 dwts. per ton, at the end of 1917; although during the year 1918 the tonnage of ore crushed amounted to nearly 314,000 tons. These satisfactory conditions have been continued during the current year, and the September quarterly report showed a working profit for that period of £43,192, with a gold reserve at date of £12,600. Moreover, greatly improved developments are advised from the Cymric Hill property, and it is only reasonable, also, to look for a steady reduction in working costs, especially of mining supplies, henceforth. Let us hope at any rate that this is not a too optimistic view.

TOPICS OF THE WEEK.

COMPANY LAW REFORM AND NEW FLOTATIONS.

Recent remarks in these columns regarding greater publicity for new flotations have borne good fruit. We understand that the Johannesburg Stock Exchange has passed a resolution to the effect that it will not grant an official quotation to the shares of any syndicate unless particulars of the undertaking are advertised in the Press beforehand for the information of the public. This is a welcome innovation, and should go far to obviate occurrences of the kind recently referred to in our columns. At the same time, of course, it must be remembered that the Committee of the Stock Exchange has no jurisdiction over new flotations as such, nor can they prevent members from dealing in any stock they like on the floor of the house. In regard to that they are in a different position from the Committee of the London Stock Exchange, which by refusing to give a fortnightly settlement to any share can effectually debar it from the house. All the local Stock Exchange Committee can do is to refuse to recognise dealings in any share for which a quotation, either official or unofficial, has not been obtained. The fact of the matter is that the trouble lies mainly with the divergent company laws of the four Provinces. The Transvaal Company Law is generally considered to be a fairly strong and useful measure designed to protect investors. One of its chief provisions is that the prospectus of any new issue must be lodged with, and approved by, the Registrar of Companies. But companies registered in the other Provinces escape this and other restrictions, with the consequence that most of the new companies and syndicates doing business here and drawing their capital from the Transvaal are registered elsewhere. The obvious remedy is the codification of the Company Laws of the four Provinces, and this is a reform the Chamber of Mines, the Associated Chambers of Commerce, and other public bodies have been urging for many years. It is understood that a uniform Company Law has actually been drafted for the Union, but has had to be held up with several other similar codifying Bills, owing to pressure of other Parliamentary work. It is earnestly to be hoped that the matter will be brought up at any early date in the new Union Parliament. In the meantime, we welcome the new Stock Exchange resolution, and note that it is based mainly on the new ruling of the London Stock Exchange. The latter, we may repeat, is as follows: In future, before leave is given to deal in securities which are issued without any prospectus publicly advertised, or circulars to shareholders, an advertisement must be inserted in two leading financial papers, giving all necessary details relating to the formation of the company and to the flotation of the issue, and stating that the directors collectively and individually are responsible for the information advertised. These details must include statements by the chairman or secretary of the company as to:—(1) The capital, authorised and issued; (2) borrowing powers and the extent to which they have been exercised; (3) date and particulars of incorporation; (4) names and addresses of directors, bankers, auditors, and secretary; (5) objects of the company, nature of its business, or particulars of property acquired; (6) material conditions relating to: (a) the formation of the company; (b) the flotation of the issue. Had something of this sort been in operation during recent months it might have prevented some of the more notorious "ramps" that have been the talk of the market. The *reductio ad absurdum* was reached when dealings were transacted in "Stanley Diamonds," which turned out to be merely a practical joke, designed to pour ridicule on the flood of new syndicates in which people were dealing though they knew nothing about them. Though that kind of thing will be prevented by the new Stock Exchange ruling, the position will not be entirely satisfactory until the Company Laws of the Union are assimilated. Until the coming General Elections are decided, nothing, of course, can be done in that direction. After that portentous event has been safely negotiated, we shall return to the subject, and keep it before the public until this very necessary reform is secured.

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THE INDUSTRIAL SITUATION AND THE MINING HOUSES.—II.

The Industry's Sword of Damocles—Balloting on the Mines—Rising Costs—Figures for 1914 and 1919 Contrasted—Expanding Labour Requirements—The "Tropical" Labour Fallacy—The Raw Article and the Finished Product—Native Schools of Mines Advocated.

SINCE our last article on the subject of the industrial outlook and the mining houses there has been little or no change in the situation. One hears a diversity of opinions as to what is likely to happen. Some usually well-informed persons contend that the Federation of Trades have spoiled their chances of bringing off a coup by confusing the issue of consolidated war bonus and pay with the other demand for shorter hours. The men are naturally out to get all they can in the direction of higher wages, and it is generally believed that the Chamber will concede something on this point but will at last stand firm in refusing any further reduction of hours. Meanwhile a ballot is being taken, and the latest information we can glean on the matter is that the questions on which a vote is being taken are: (1) Are you in favour of a strike? (2) Are you in favour of allowing the executive of the S.A.I.F. to handle the matter? And so for a time the sword of Damocles hangs over our heads, and this combined with the forthcoming elections has created a position of uncertainty which is prejudicial to the mining industry and all connected with it.

HOW COSTS HAVE RISEN.

Meanwhile gold has further risen in price, and the prospects of better returns from the mines on this account are decidedly good. The gold premium does not, however, do away with the necessity for reducing working costs on these fields, and to this aspect of the subject we propose to devote further consideration this week. In our last issue we referred to the very great appreciation in working costs on Witwatersrand mines in the past five years, and further to amplify this assertion we give hereunder a table setting forth the working costs of Witwatersrand mines in December, 1914, and in December, 1919, or November, 1919, where working cost figures for last month have not been communicated by groups up to the time of going to press. The table, from which it would be dangerous to draw anything more than broad inferences, is as follows:

	Costs per ton milled.			
	Dec., 1914.		Dec., 1919.	
	s.	d.	s.	d.
Central Mining Group:				
City Deep	21	4	27	10
Cons. Main Reef	21	7	31	5
Crown Mines	16	4	25	1
Durban Roodepoort Deep ..	22	1	36	4
East Rand Proprietary ...	19	8	26	9
Ferreira Deep	21	10	27	4
Geldenhuis Deep	21	8	27	4
Knight Central	18	8	31	7
Modder B.	15	6	25	7
New Modder	16	7	22	0
Nourse Mines	22	3	29	2
Robinson	14	5	21	3
Rose Deep	16	10	21	9
Village Main Reef	19	4	22	9
Wolhuter	17	2	25	9
Village Deep	17	1	30	9
Johannesburg Consolidated Investment				
Consolidated Langlaagte .	14	6	21	4
Government Areas	19	11	23	3
Langlaagte Estate	18	1	23	7
New Primrose	12	8	20	10
New Unified	12	3	19	3
Randfontein Central	16	4	21	11
Van Ryn Deep .	16	1	22	5
Witwatersrand ..	14	3	23	3

	Costs per ton milled.			
	Dec., 1914.		Nov., 1919.	
	s.	d.	s.	d.
Consolidated Gold Fields of S.A.:				
Jupiter	—		23	11
Knights Deep	12	3	16	3
Robinson Deep	17	8	25	8
Simmer and Jack	12	11	21	3
Simmer Deep	15	5	22	0
Sub Nigel	35	0	42	0
General Mining and Finance:				
Aurora West	18	0	25	10
Meyer and Charlton	17	5	24	5
New Goch	13	4	20	5
Roodepoort U.M.R.	16	7	23	4
Van Ryn	14	1	18	1
West Rand Consolidated	19	1	24	9
Anglo-French:				
New Kleinfontein	15	8	26	7
Consolidated Mines Selection:				
			Dec., 1919.	
Brakpan Mines	18	0	30	10
Springs Mines	—		28	7
Union Corporation:				
Geduld Proprietary . ..	24	2	22	9
Modder Deep	—		21	1
Princess	24	4	33	5

In considering the above figures it should be remembered that no close comparisons are possible. Different reef conditions, different percentages of sorting, different milling capacities at different periods make hard and fast deductions unreliable, if not dangerous. But one or two rough facts emerge in their crude indisputability from the above comparative tables. In the first place it is evident that working costs have risen to such a degree that were it not for the gold premium many mines would have to relapse into idleness. And in the second place it is clear that it is not always the largest corporation and the wealthiest mine which makes the best showing in the matter of economical and efficient management. It is clear too that with the costs of labour and commodities exhibiting no tendency towards decrease—on the contrary, the tendency is for wages and prices to increase—it is high time that some practical steps should be taken to secure more efficient working of the mines.

THE NEED FOR DISCIPLINE.

We hold that an improvement in the discipline of the underground labour force is one of the essential needs of the Reef. No industry can obtain the best or even moderately good results if there is a spirit of insubordination abroad—a spirit which the management on the spot is not allowed to quell. Increased costs of production are common all the world over, but, as we said in our last issue, it is held by many that the peace-at-any-price policy pursued by the Chamber of Mines has been responsible for undue increases in costs. Apart from questions appertaining to the improvement of white labour efficiency in the mines and the employment of labour-saving devices wherever practicable, there is the question of obtaining adequate supplies of native labour.

NATIVE LABOUR SHORTAGE.

Ever since the mining industry of the Witwatersrand assumed any dimensions of importance the demand for native labour has been greatly in excess of the available supply. The insufficiency of native labour has over and over again been held responsible for failure to realise the hopes held out to shareholders in practically every company operating on the Rand. One is indeed tempted to wonder what numerous chairmen at many company meetings would have done to justify the results secured by their concerns but for the ever available excuse that supplies of native labour were insufficient.

It is, however, undeniable that throughout its history the gold mining industry of the Witwatersrand has been severely penalised through lack of that necessary *desideratum*, without which most of the Rand's gold mines would be unprofitable ventures. With the development of agriculture and of other industries in the country the supply available for the Rand becomes more and more restricted and more difficult to obtain, and it has for long been evident that the supplies available in British South Africa are insufficient to meet expanding requirements. Even with the assistance of labour from the southern portion of Portuguese East Africa, the demands of the mines are not met, and it must be very evident that so long as this industry depends on cheap menial labour supervised by highly-paid whites it will be necessary to exploit other spheres of territory if the industry is to obtain anything like its adequate reward in the shape of profits. In view of the medical researches of Sir F. S. Lister, which have definitely established the fact that pneumonia (the disease to which natives from northern latitudes have been so markedly susceptible on the Rand) can be almost completely eliminated by methods of inoculation, we fail to see any objections to obtaining natives from north of latitude 22 deg. S., provided the present methods of recruiting labour in Portuguese territory are admitted to afford no just cause for complaint.

Labour from Northern Latitudes.

The Low Grade Mines Commission recommended to the Government that recruiting in northern latitudes should be resumed by arrangement with the Portuguese Government, but so far we are unaware that any action has been taken in this direction. Labour from northern latitudes is invariably referred to as "Tropical Boys." This term is not consistent with actual climatic conditions. Anyone who knows anything of Eastern Central Africa will tell you that there are immense and densely-populated stretches of territory wherein the mean annual temperature is very little less than that of the Witwatersrand. The Uhehe highlands and the country around New Langenburg may be cited as areas containing a strong and virile class of Bantu living on high plateaux which, although not many degrees south of the equator, are not vastly different from the Witwatersrand in their climatic features. There are immense reserves of labour to be obtained in these high-lying northern latitudes, and it is regrettable that the Chamber of Mines or the mining corporations have not been able to persuade the Government to allow them to obtain native labour from the northern latitudes in order to ensure for the industry a greater measure of prosperity than it at present enjoys.

Why Import the Raw Article?

There is another direction in which the Chamber of Mines might move, and that is in the establishment of training schools in centres from which large supplies of native labour are derived. Why should the Rand import the raw article in its labour supplies when by the establishment of native mining schools the labourers could be taught the rudimentary principles of underground work and particularly of "Safety First" before they leave their homes? Such a scheme certainly appears practicable, and if it were carried out successfully a selection could be made in the native territories and the new recruits would have a lesser probationary period to serve on arrival on the Rand. We intend to examine this matter more closely in the near future. It would appear to be good business from the point of view of the industry as well as of the native and certainly it seems worthy of investigation.

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THE LATEST GRIQUALAND WEST DIAMOND DISCOVERIES.

West End and Postmas Developing Well—Is there a Nest of Diamond Pipes ?

THE eulogistic references in recent issues of this paper to the new diamond pipes discovered in the Postmasburg district of Griqualand West continue to be justified by developments. The West End mine is opening up excellently, according to unofficial reports, and showing a good yield of high-quality stones. A few thousand yards away Mr. Dale Lace is opening up a large mine on Postmasburg by means of half-a-dozen incline shafts, all of which are in good yellow ground. So far, everything points to the existence of a large mine. A little further on a prospect of smaller claim area but with equally good diamondiferous indications is also being opened up by Mr. Dale Lace, and it looks as if a nest of pipes of varying values and sizes may exist in the district. At the beginning of the week the secretary of the Postmas Company communicated the following telegram received by Messrs. Dale Lace and A. Langebrink, dated from Postmasburg, January 17, 1920: "In No. 1 mine we are finding diamonds of good quality. We have already opened up 500 claims by shafts and adits; prospects are very good. In No. 2 mine, discovered December 24, we have already defined over 300 claims; is very clean mine so far, and is very promising. Tarrys are loading up new machine to-day for No. 1 mine, and two other machines are under order for delivery in three weeks' time." Some twenty miles further west the Makganyene Diamond mine is said to be opening up satisfactorily, and the whole district, in view of recent discoveries, is now certain to be thoroughly explored.

THE TRANSPORT QUESTION.

Transport, of course, is a difficulty, but it is hoped that in the near future the Government will recognise that the growing economic importance of the district warrants the construction of a light railway, certainly the provision of very much improved roads. Griqualand West has long felt the need of a line to tap its natural resources; and successive Governments have promised to provide the requisite facilities, hitherto without any tangible result.

GEOLOGY OF THE DISTRICT.

The best and most authoritative account of the geology of the district was given by Dr. Rogers in the annual report of the Cape Geological Commission for 1908. To that report is attached a valuable geological map, which unfortunately for us is in colours and therefore impossible to reproduce here. In an early issue, however, we hope to print a black and white plan of the district which will serve to illustrate the position of the different diamondiferous occurrences now being exploited.

PERSONAL.

The Council of the Institution of Mining and Metallurgy has elected Mr. Frank Merricks as President of the Institution for the coming year.

* * * *

Mr. W. C. Stephens, managing director of the Climax Rock Drill and Engineering Works, of Cam Brea, Cornwall, has arrived on a visit to the Rand.

* * * *

Last week Sir Lionel Phillips presented the gold medal of the S.A. Institute of Electrical Engineers to Professor Buchanan for his work with the establishment of the first electric steel melting furnace in South Africa. He said that the output of this furnace, which was on the Rand, was now 85 or 90 tons of shoes and dies for the mines per month. They were not equal in quality to those imported, but would be so in time. He had no doubt they were being supplied at £20 per ton, whereas the cost would be £45 if they were imported.

* * * *

Mr. William Kilpatrick, Chief Foreign Representative of the well-known Glasgow firm of sugar machinery manufacturers, Messrs. Duncan Stewart & Co., Ltd., has recently arrived in the Union, and intends making an extended tour of the sugar-growing districts. Since the Armistice Mr. Kilpatrick has been visiting the branch offices and agencies of his firm in various parts of the world, and last year he was in the United States, Cuba, British West Indies, and parts of South America. During recent years Messrs. Duncan Stewart & Co. have largely increased their works, and at the instance of Sir William Beardmore, the chairman of the concern, are making strenuous efforts to regain their very large export trade, which, owing to the exigencies of war work and Government restrictions, had to be more or less abandoned. Messrs. Fraser & Chalmers (S.A.), Ltd., of Johannesburg, hold the agency here, and nothing will be left undone to give the best possible service to existing sugar manufacturers and promoters of new schemes.

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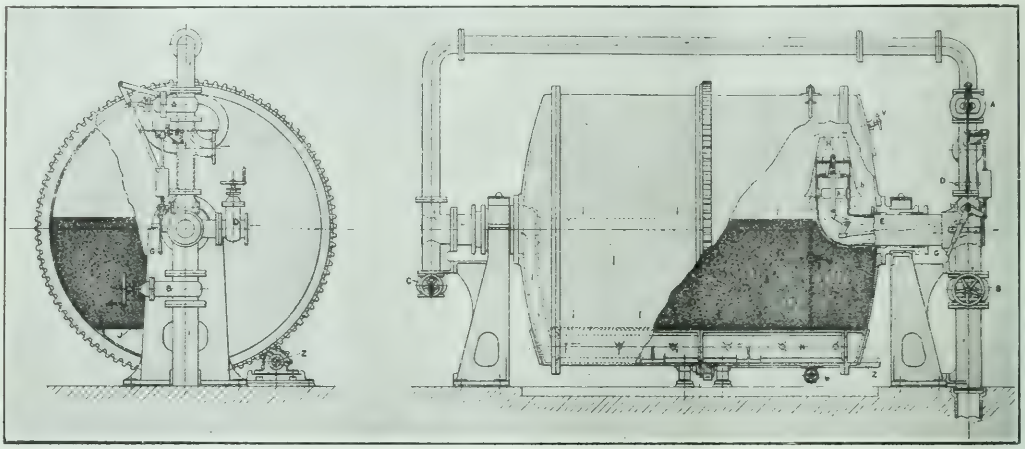

A Outlet and Wash-Water Valve
B Wash Water Valve
C Starting Wash-out Valve
D Inlet Valve
G Syphon Valve Handle
V Air Valve

The chief feature is the method adopted to cleanse the filter bed, and on this ultimately depends the constant, regular, efficient working of the filter.

The "Turn-Over" system of cleansing was designed to overcome previous difficulties experienced in the thorough cleansing of the filter bed.

The main objects achieved by the "Turn-Over" system are :—The displacing and cleansing uniformly every portion of the filtering material from top to bottom of the bed; the thorough cleansing of the whole bed without being dependent on a voluminous reverse flow of water under high head from nozzles, and the dispensing with the use of other common forms of agitating gear (which all have their objectionable features) such as rakes, revolving arms, etc, steam jets, or compressed air. The "Turn-Over" system effects a thorough cleansing with a comparatively slight reverse flow of cleansing water at a low head, and can therefore work where other systems are impossible.

CLEANSING.

The cleansing operation is performed by revolving the whole chamber and completely upsetting the whole filtering material, whilst the slight reverse flow of cleansing water is admitted to wash out the impurities.

The claim that this system leaves the filtering material absolutely clean throughout has been repeatedly verified by examinations made by interested engineers after the filter has been years at work.

By the arrangement of syphoning the dirty wash-water is quickly got rid of and the least possible amount is used.

A "Turn-Over" Filter Plant is in successful operation at Vereeniging, filtering water from the Vaal River. Copy Reports on the working of the plant and Reports of Analyses of the water will be sent on application to————

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THE "C.M. AND M." MINING EXHIBITION.

Viscount Buxton's Opening Address—Excellent Safety First Showing—Some Notable Exhibits.

THE fourth mining exhibition of the Chemical, Metallurgical and Mining Society of South Africa was opened at the School of Mines this week by His Excellency Lord Buxton, before a distinguished gathering of mining men. A feature of the exhibition is the specimen of work done on the mines during the War in providing substitutes for articles usually imported, while the exhibits of other apparatus and appliances used on mines and works, safety first devices, and crude and manufactured products filled all the space in the Assembly Hall of the South African School of Mines. Several small inventors are taking advantage of the exhibition to show their devices to the public. The president of the Exhibition Committee, Mr. Jas Gray, F.T.C., welcomed His Excellency, who, in opening the exhibition, said:—

I am very glad to be here, for this movement is a practical one, and a many-sided one, and all the facets are good, for its object is to combine educational and humanitarian, as well as economic and industrial, development. The Society under whose auspices we are met to-day is the Chemical, Metallurgical and Mining Society of South Africa, a clumsy, but descriptive title. Its main object, as I understand, is to exchange ideas; to disseminate and spread scientific and technical knowledge. The Society was instituted as long ago as 1894. I am told it was the outcome of a supper, which clearly must have been of a light and wholesome character. It has had the inevitable vicissitudes due to the volcanic and eruptive disposition of this country. Much valuable pioneer work has been done by the society, especially in reference to the amelioration of underground conditions. The Society can be especially proud of one thing. It can justly claim, I believe, to have been the first to have given attention to that scourge of the industry, miners' phthisis, and has done much in various ways for the amelioration of that terrible disease by proposals for improved ventilation, the determination of injurious dust particles, the allaying of dust, and the elimination of injurious fumes. It must be admitted, I fear, that in earlier days there was undoubted neglect in these matters; more, I think, from want of thought than from want of heart. Knowledge was amateurish, the conditions of the industry and its attendant dangers were not realised or understood, and the application of remedies was slow and faulty. But that period is long past, and of late years a different spirit has prevailed, and, coincident with an increasing desire on the part of employers and others to do what could be done for the well-being of the employees, whether whites or natives, medicine and science have come to their aid, and care and research have been effectively applied. The greater care and greater interest shown has also, I believe, helped to improve the relations between the employers and the workmen.

SAFETY FIRST.

The society in this and in other ways has advocated and assisted in what is called "Safety First," the safety and welfare of those working underground and elsewhere, to reduce the liability to accidents, and to improve the surrounding conditions. One side line of its activities in this respect has been its effective co-operation in the creation of the Red Cross Society for First Aid, Accidents, and Ambulance work. In this connection the community is deeply indebted to Mr. Fred Rowland for the great work he has done while with the Red Cross Society. Now that he had to give up the hon. secretaryship he has left the society in a good condition, and I am sure that in future it will benefit by his advice and assistance. (Applause.)

My special duty to-day is to open this exhibition, the fourth of its kind. Exhibitions were held in 1912, 1913 and 1914, when the war intervened; and it is now thought that the time has again come when an exhibition can be advantageously held. Its main objects are to bring to the notice of those interested in the mining industry, and to the public generally, the many ingenious devices of inventors, the ocular proof of the natural products of the country, examples of life-saving apparatus, etc. The exhibition, it is hoped, will encourage and stimulate inventive capacity in those who have an opportunity of studying the working in mines and elsewhere, either for safety or for economy of working, which often go together. It is especially an encouragement to "small men." Indeed it may be called a small men's exhibition; and it is often from the small man working at the industry that the big invention has come—Watt, Arkwright, etc. To these it gives an opportunity, which they would not otherwise have, of showing what they can do, and assisting them to work out their ideas. Inventors are somewhat difficult to deal with, as I know by painful experience at the Board of Trade and at the Post Office in England. If the invention is not at once adopted the inventor so often imagines that the powers that be are in league against him a quite unfounded suspicion. Here at least the invention, if it is worth anything, can be practically considered and examined; and at all events the suspicion that it is ignored and suppressed without consideration would disappear.

PICKING BRAINS.

One object of the exhibition is no doubt to pick brains. But it also gives to those whose brains are picked an opportunity of benefiting from their own grey matter. Then, again, the owners of mineralised ground and others will have a good opportunity of showing what minerals and raw products are to be found in the country. One of the Inspectors of Mines in his report for 1917 shows that the surface of the country has as yet been barely scratched. But much more is needed than mere scratching. It is no good merely asserting, or even showing, that there are minerals unless the ore is properly developed, and the resultant product shown to be equal to the samples. All this requires hard work, industry, intelligence and scientific and technical application. South Africa is still in its infancy. It needs population, capital, industries, increased production from agriculture and from existing industries, and the opening up of new industries. Arthur Young, the economist, once said that he who produced two blades of grass where only one grew before, was a public benefactor. Still more can it be said that he who, by any invention, saves two lives where only one was saved before, is a great public benefactor; and he who by some invention doubles the production of some useful mineral benefits the community. It appears to me sometimes that the tendency in this country to rely on Government aid is rather too pronounced. It is a very good thing that the Government should be interested in, and encourage, all improvements, humanitarian, industrial, and economic; but what is even more important, is that initiative and self-reliance should not be weakened by over-dependence on Government. The past history of this country is a great example of what can be done without Government assistance and by self-reliance, courage, and enterprise. This society and exhibition will do much to help South Africa towards the development of existing and of new industries. (Applause.) His Excellency then declared the exhibition duly opened.

Sir Evelyn Wallers, in thanking His Excellency for his attendance, voiced the general regret of the community that the time was approaching when their Excellencies would be leaving us. They had established a place in our hearts that was given to few. (Applause.)

SOME NOTABLE EXHIBITS.

Among the most notable exhibits are those of the Chamber of Mines, the "Safety First" Committee, and the specimens of local minerals.

The Transvaal Chamber of Mines is showing: (a) A collection of jack hammer rigs, and other rock drills, etc., together with photographs and drawings of rock drilling machines; (b) apparatus for illustrating to miners errors frequently made when drilling a cut. This is set up in the lane immediately in rear and outside the hall. The Dust Sampling Committee of the Transvaal Chamber of Mines is showing apparatus used in taking and testing samples of dust underground, including konimeters, dust pump, sugar testing apparatus, etc. The Miners' Phthisis Medical Bureau, of which Dr. W. Watkins Pitchford is Director, is showing X-rays as an aid to the diagnosis and study of diseases of the chest: (1) radiogram of the chest of a healthy person; (2) radiogram of the chest of a man who is beginning to develop silicosis; (3) radiogram of the chest of a man with well-marked silicosis; (4) radiogram of the chest of a man with advanced tuberculosis (consumption) but without any silicosis. Major H. Standish Ball, O.B.E., R.E., is showing geophone as used on the Western Front for detecting sounds underground. The Rand Pioneers, Johannesburg, show pictures and photographs, etc., of: (1) the first house built in Johannesburg; (2) the first Government officials on the Rand; (3) the first chemist's shop in Johannesburg; (4) the original Standard Bank in Johannesbrug; (5) the beginning of the Eagle Mine; (6) the Rand Club in 1888 with some early members; (7) the Wemmer Mine and "Diggers' News" Printing Works in 1889. The Witwatersrand Co-operative Smelting Works, Ltd., shows shoes, dies, etc., made from scrap by an induction electric steel-melting furnace, with a capacity of one ton every six hours. The Rand Mutual Assurance Co., Ltd.: Prevention of Accidents (Safety First) Committee, Cullinan Buildings shows a collection of safety first exhibits; accident "savers"; safety first literature; inter-mine sporting trophies, etc., etc. (These exhibits occupy the whole of the platform).

MINERAL PRODUCTS DISPLAY.

Budd's Magnesite Mine, Kaapmuiden, show sample of magnesite ore. Consort Mine, Consort P.O., Transvaal, show products of mine: arsenic, arsenite of soda, etc. Doornhoek Lead Mines, Zeerust, or P.O. Box 2893, Johannesburg, show samples of lead ores and blocks of galena. Mr H. Y. Morgan, 46 Plein St., Johannesburg shows samples of silver lead ore from Broken Hill Mine, New South Wales. Scotia Talc Mines, Ltd., Chorlton Chambers, Harrison Street, Johannesburg, show talc nickel and pigments, bath, face and baby powders, electrical insulators, oil and water paints, and tiles. Mr. H. A. White, P.O. Dersley, shows: (a) sample of copper ore from Katanga, (b) piece of native smelted copper. Zaaiplaats Tin Mining Co., Ltd., show tin ore, concentrate, crude metal, slag, dross, hardhead and refined metal in the form of ingots, strip and granulated tin.

CAPE DIAMOND RETURNS FOR NOVEMBER.

The output of diamonds from the public diggings in the Cape Province during the month of November was as follows (the number of claimholders in the Barkly West district being stated as 1,978):

BARKLY WEST (4,003 carats, value £78,866).

	Diggers.	Carats.	Value.
Bad Hope	2	8¼	£124
Delport's Hope	38	235¼	4,914
Forlorn Hope	1	0¾	6
Gong Gong	35	247¾	5,602
Good Hope	104	498¾	6,412
Harrisdale	29	155¾	2,773
Hebron	72	273¾	5,273
Holpan	30	80¼	1,250
Jonas Kopje	1	10¾	260
Kareepan	52	387½	8,106
Keiskama	4	12¼	104
Klipdam	69	316½	5,350
Klipdrift	41	188¼	2,142
Last Hope	3	19¼	367
Longlands	33	478¼	12,130
Niekerk's Rush	14	76½	1,790
Rickett's Prospect	9	32¼	521
Scholtz's Prospect	27	138½	4,040
Snyder's Rush	14	126	2,608
Union Kopje	1	5	76
Van Zoelen's Laagte	6	21	413
Waldeck's Plant	43	289¼	5,475
Ward's Hope	12	59	1,372
Winter's Rush	38	342½	7,753

HERBERT (1,110½ carats, value £23,168).

Brypaal	25	82	2,328
Davisdrift	2	21¼	627
Mosesberg	126	728¾	14,999
Platdrift	1	3	74
Schmidt's Drift	66	272	5,106
Sevonelles	1	3½	32

KIMBERLEY (58¼ carats, value £1,345).

Robinson's Kopje	3	14½	303
Wedberg	6	43¾	1,041

TAUNGS (1,288½ carats, value £24,780).

Home Rule	100	1,266	24,540
Killarney	4	22½	240

PRIVATE ESTATES.

River View Diamond Syndicate ...	371½	8,197
Pniel Estate	182½	3,962
New Vaal River D. & E. Syndicate ...	1,038½	21,451

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Resident Engineer and Electrician.

Applications are invited for the above position from Engineers who have had previous experience in a similar capacity.

Candidates must be skilled in mechanical and electrical engineering and have experience in the operation of an electric power plant and should be familiar with the three-phase system of distribution.

The salary offered is £45 per month.

The following particulars should be given:—

1. Nature of present employment.
2. Date duties can commence.
3. Copies of three testimonials.
4. Brief record of technical and practical training and experience.
5. Copies of Government and other Engineering Certificates.

Applications to reach the undersigned not later than 12 noon on Saturday, the 31st January, 1920.

Canvassing of members of the Council is forbidden on pain of disqualification.

S. F. GOCH,
Town Clerk.

Town Clerk's Office,
8th January, 1920,
Pietersburg.

CORRESPONDENCE AND DISCUSSION.

Grasmere Township.

To the Editor, *S.A. Mining and Engineering Journal.*

Sir,—Please be kind enough and let me know through the correspondence column where to get any information regarding the "Grasmere" Township.—Yours, etc.,

T. W. D.

Barkly West,
15th January, 1920.

[Perhaps some of our readers can oblige.—Ed.]

Forgotten Syndicates.

To the Editor, *S.A. Mining and Engineering Journal.*

Sir,—Being an interested reader of your notes in your esteemed journal, I beg to enquire whether you will kindly through that medium furnish me with some information regarding the undermentioned shares: (a) Orangia Coronation East Exploration Syndicate, Ltd.: These shares are signed by Arthur S. Winder and A. S. J. Moris as directors, and Geo. W. Cowen as secretary, and are registered under the Transvaal Laws. Capital was £32,500 in 6,500 shares of £5 each. If this syndicate be still in existence, is it the one over which Mr. H. Graumann presided recently at Johannesburg? If not, do you know anything about it, and what are the shares worth? (b) The Komas Copper Mine Syndicate, Ltd., G.S.W. Africa: Capital is shown as £6,000 in 240 shares of £25 each. Shares are signed by names which appear to read "Arth. A. M. de Witt" and "James Monbuth" as directors, and "J. Leanorie" as secretary. Is syndicate still in existence, and if so what are the shares worth to-day? (c) Natal Ocean Collieries Company, Ltd., Capetown: Capital is shown at £164,000 in £1 shares, which are signed by what appears to read "J. G. Runicam" and E. H. Kirkman as directors, and James Guthrie as secretary. Have you any information about this company, and what are the shares worth to-day? I shall be very grateful for any information you can kindly advance about the above-mentioned shares, and returning thanks in anticipation of same.—Yours, etc.,

"PUZZLED."

P.O. Box 396, Kimberley,
19th January, 1920.

[Perhaps some of our readers will help us to answer the above queries.—Ed.]

THE LEAD OCCURRENCES OF THE UNION.

The Argentiferous Galena of the Pretoria Series—A Review of Old Workings.

So much interest has lately been evinced in the lead occurrences in the Union, in view of the high prices for the metal, that the following brief account, taken from Dr. Versfeld's report on base metals published last year, may be of use to readers. Dr. Versfeld, it will be seen, does not seem to have studied the Pretoria and Argent district occurrences in very great detail, contenting himself with a brief summary of those occurrences. He writes:—

Lead ores occur in South Africa, as in many other parts of the world, in the limestones and dolomites of the older geological formations. Small pockets of galena, in some cases argentiferous, are frequently found in the dolomite series of the Transvaal. In the Pretoria series true veins are found carrying galena either alone or associated with gold, silver, copper and cobalt. In the Pretoria, Rustenburg, and Marico districts are many vein deposits of lead ores associated with copper, the best known being the Transvaal Silver Mine in the Pretoria district, where argentiferous galena is associated with iron pyrites, copper pyrites, copper carbonates, and tetrahedrite, in a gangue of siderite (carbonate of iron). This vein is associated with a diabase dyke. At the Willows Mine is a very similar deposit but without the lead ore. At Edendale, four miles north of Hatherley—also in the Pretoria series—a vein has been worked in which galena occurs in conjunction with zinc blende and the usual oxidized ores of lead and zinc. The gangue material is mainly quartz and calcite. At Leeuwkloof (Pretoria district) and Rhenosterhoek (Marico district), in the Transvaal, lead ore has also been worked. At Leeuwkloof the galena occurs in the form of a large chute in the dolomite underlying the shales of the Pretoria series, and at the contact with the shales. The chute runs north-west and south-east, and dips to the south-west. The galena is of good quality, the 700 tons so far extracted averaging 73 to 75 per cent. of lead. The silver value is very constant, always being between 2 and 4 ounces per ton. Associated with this lode is a large body of iron pyrites about 100 feet thick. At Rhenosterhoek the deposit is also in dolomite almost at its junction with the Pretoria series. The occurrence is very similar in character to all the other small galena deposits in this district, the ore usually being brought under notice through small outcrops of galena showing on the surface, and in almost all cases decreasing in value with depth, usually giving out at a depth of about 50 feet or less. The Rhenosterhoek occurrence was discovered in this manner some thirty-five years ago, and a small amount of galena was at that time taken out by means of open-cast workings. The mine is now being worked through an adit driven into the base of the hill on which the deposit occurs, at a level of 75 feet below the original outcrop, at which depth solid dolomite is met with, and the vertical extension of the galena deposit, in its original form, appears to be reached. The ore is now extracted principally by overhand stopping, and the deposit increases in value as the work approaches the surface. The mine is not being worked to its full capacity, owing to the practical impossibility of shipping the ore during the continuance of hostilities in Europe and to the very limited local market. The ore now being taken out is smelted in Johannesburg, and is used principally in the manufacture of nitrate of lead.

OTHER FINDS.

At a number of other localities in the Transvaal, lead has been mined in the past, but the mines are at present shut down—some only on account of the War. The chief localities are Witkop, Bokkraal, Buffelshoek, Rietspruit and Doornhoek—all in the Marico district; Broederstroom, Edendale, Dwarsfontein, and Roodekrans—all in Pretoria district—and Windhuk, in Pietersburg district. Throughout the whole of the dolomite area of the Transvaal irregular deposits of galena are found and occasionally worked, the ore being sold to the ore-reduction companies on the Rand. A fissure vein was formerly worked near the railway station of Argent, 50 miles east of Johannesburg, and several other such occurrences are known in Northern Transvaal, Waterval Onder, Natal, and Gordonia. Near Potgietersrust (Transvaal) is a lead deposit situated on a ridge which forms the boundary between Uitloop and Rietfontein. The main occurrence is in a narrow but sharply defined zone of altered granite, which strikes approximately north and south, and dips at a big angle to the west and is traceable for some distance. A similar occurrence has been noted a short distance to the west. The lodes are characterised by bluish chert-like rock in the altered granite, associated with fluorite and galena. The country rock is the older (or Archaean) granite.

CAPE OCCURRENCES.

In the Cape Province lead ores occur at the Maitland Mine (Port Elizabeth) associated with copper, silver, and antimony, at Banghoek, 40 miles west of Hopetown, in quartz veins at Knysna, at Richmond, and in the Beaufort West and Victoria West districts. In the Bokkeveld series of the Caledon and Swellendam districts of the Cape Province a number of white quartz veins are noticed, some containing small quantities of galena, with copper and iron pyrites. These do not appear to be of commercial importance. A little galena has also been obtained from a vein in a Karroo dolerite near Sutherland. The writer has also examined specimens of lead ore in reef quartz from Kakamas, Griquatown, and Montague, in dolomite from Bechuanaland, in the form of cerussite (with malachite) from Damaraland, and other ores from Burghersdorp and Van Rhynsdorp. In the last-named district a large vertical reef has been discovered, consisting at the surface of pyromorphite (lead phosphate) associated with copper and antimony.

NATAL PROSPECTING.

In Natal no extensive deposits of lead ores are known, but some prospecting work has been done on a quartz vein in the bedding planes of a schist in the Mfongosi and Ngobevu Valleys, near the Tugela River in Zululand. The vein varies in width from 3½ to 14 feet and contains, where opened, only small and isolated nests of galena, so the prospects are not very promising. Galena has also been found at Umsingi and in Umvoti County.

PROSPECTS OF FURTHER DEVELOPMENT.

Since lead ores have been proved to occur at numerous localities where dolomite is found, and since they seldom form easily recognisable oxidation products at the surface, it seems extremely likely that there must be numerous occurrences still undiscovered. The limestones and dolomites of the Otavi series in South-West Africa, the Malmesbury, Congo, and Ibiquas series of the Cape Province, and the dolomite series of the Transvaal, are very largely covered with soil owing to the ease with which they weather. They have, in consequence, been little prospected, and, though prospecting will not be easy, there seems little doubt that many discoveries will in time be made. The deposits so far known are of such a nature that under existing conditions only small profits if any can be made. There appears to be no reason, however, why lead mining in South Africa should not be made very profitable with proper organisation and co-operation, since a considerable local demand will always exist.

THE PRACTICE OF STEAMING AMALGAMATION PLATES.

Report of Sub-Committee of Messrs. S. H. Pearce and J. E. Thomas.*

In view of a recent discussion as to the practice of steaming amalgamated plates—your Council requested us to investigate the matter and draw up a report as to its advisability or otherwise, and to include any other matters concerning amalgamation of general interest. We accepted the invitation with some misgiving, as we realised that the subject would require much time. In order to save time we asked the secretary to issue a circular to our mill manager members, in which a number of questions were put and from which, together with our own experience, we hoped to be able to present something of some authoritative interest. Something less than half of these were answered and to those gentlemen who co-operated in this respect we tender our hearty thanks as we used their contributions for a basis of the following remarks:—

A great diversity of opinion exists in connection with steaming, starting from those who are of opinion that by reason of danger to health it should be prohibited, down to those on the other side who equally emphatically declare it to be a necessary operation. In between we have milder expressions from those who advocate steaming as being a saving of labour, or advisable for better amalgamation and from others who suggest various methods of dispensing with the operation. Leaving out the extremists on both sides the question resolves itself into practically a question of labour as well as health. Under certain conditions amalgam will accumulate on plates which requires a good deal of labour to remove unless steam is used to soften the deposit. This labour will vary from scouring in various ways to the use of chisels, according to the time the deposit has had to harden. The conditions of accumulation run in fairly definite lines, apart from voluntary accumulation for purposes of regulating the output—a matter on which we have no evidence. Roughly speaking the involuntary accumulation may be divided into two classes—viz., that due to the mill methods employed in the first place, and that due to force of circumstances in the second, with of course an intermediate link of a combination of both. Now the mill methods class will mean the individual system adopted by the man in charge, whereas circumstances will include the design of plant, besides any idiosyncrasy of the ore dealt with. Thus a variety of method is shown in the condition of the plate, (*i.e.*, whether hard or soft) the frequency of dressing and the grade of plate, which all have a relation to each other. For instance a plate that has a comparatively large amount of amalgam left on it will be capable of receiving a liberal allowance of mercury when dressing, and will remain soft and in a good receptive condition longer than a comparatively bare plate under equal conditions. To preserve this quality, such plates will be scraped but lightly, and the result is an accumulation which produces a high steaming return. The man who adopts this method will obtain a high return by amalgamation with the least labour, but will probably be accused of holding gold back, and may be reckoned a culprit as far as advocating steaming is concerned. The next example may be taken where a similar condition of plate is arrived at with a minimum of amalgam left. This will require more frequent dressing to prevent hardening up, and hard scraping every day; probably also a thorough scouring, say every other day. This man will also have a high amalgamation return with a maximum of labour and the conscious rectitude of a humanitarian who does not advocate steaming. A variety of the foregoing is found in those who prefer to scour less often, but make a big job of it once a month, in place of steaming. Another variety of method is adopted by one group where a saving of mercury consumption is effected by the use of blankets, etc., and the resulting concentrate ground up in barrels, but this method deserves a special description, and would form the basis of an excellent paper on its own. It is not proposed to go further into methods, because a difference of opinion exists as to whether a high extraction by amalgamation is desirable, or not, in view of the labour required and idle capital involved in laying out the plant. This doubt frequently entails a neglect of the fundamental condition of maintaining a proper plate surface and retaining the free gold there, instead of in various lodging places on its way to the cyanide plant. Now as to circumstance, our first variety exists in the ratio of water to rock crushed. On the one hand we have a plant with launders having insufficient grade, where the water ratio is necessarily high. On the other hand we have a more modern plant with probably excess launder grade but economic in plate area. In the first case we may have a ratio of perhaps 8 to 1, and in the second as low as 2 to 1. These differing conditions will affect the grade of the plate—18 per cent. being necessary in the one case compraed to 8 per cent. in the other. Apart from the overcrowding of the plate area, this extra grade causes difficulty in control of plate condition. With a bare plate there is nothing to arrest the mercury in its tendency to run off into the launder, so a choice has to be made between leaving a deposit or very frequent dressing. In any case amalgam at the top of the plate will harden more rapidly and require removal with more labour whether by steaming or by other means. The question of shaking plates versus stationary is practically settled. There is little difference as regards recovery by amalgamation, between the two. Shaking plates require less grade and provide for a more equal distribution of the pulp—but require power and maintenance, which perhaps more than balances anything in their favour. Shaking plates also have a tendency towards accumulating amalgam similar to a plate with a steep grade. The degree of alkalinity of the mill water also affects plate accumulations in that an excess of lime hardens the amalgam. In some mills owing to the varying acidity of the rock, the alkalinity is difficult to regulate and in these cases a scrape made in the usual way leaves a considerable quantity behind and causes a pleasant surprise on steaming. Under such circumstances it is quite possible that a hammer and chisel may be required if the plate be not heated. On the other hand cases are not unknown where neglect to neutralise the acidity has resulted in stripped plates. The fineness of the gold amalgamated is also a minor factor; coarse gold particles do not accumulate and are easily removed, but the reverse is shown in the finer particles and thus it follows that the higher percentage amalgamated will generally be obtained from a larger proportion of such fine gold, and result in greater tendency toward accumulation. An instance of this is shown on a plant where a coarse mesh is used in the mill and the pulp passes over plates before being re-ground. The mill plates show practically no return by steaming, whereas the tube mill plates accumulate fairly heavily under similar conditions. The foregoing does not pretend to deal with all the factors involved in the question, but are merely stated to explain why a difference of opinion on the subject should exist and also with an idea of possibly stimulating those who are interested to give further opinions. Dealing, however, with the facts as they appear to us from a technical point of view—steaming can only be considered as a labour-saving device, which enables plate accumulations to be removed with the least difficulty, as otherwise, in the absence of a mechanical device to take its place, a large expenditure of labour would be incurred in most instances. This is a matter on which a difference of opinion is to be expected and we present it with much diffidence, as opinion differs considerably even among those most interested. However, there is no doubt, as with many other ailments, idiosyncrasy plays a very large part, and certain men suffer from some sort of indisposition after taking part in the operation. In many instances there is a probability of mercurial affection, but in at least as many others it is equally probable that the indisposition is due to over-exertion and poor health. Nor would we care to assert that steaming is the chief cause of mercurial poisoning because the practice of eating meals with unwashed hands appear to us far more dangerous as a means of conveying mercury into the system. These, however, are matters on which medical men should speak, but in the absence of medical evidence to the contrary we do not consider, if proper precautions are taken, that steaming should not be continued. The precautions advised are well known to every one, and consist in:—Provide ample ventilation for plate houses. Lead exhaust steam from plates to the outside of the building. Select men for the operation who are known to be immune. Divide the work as much as possible to prevent over-exertion. Provide wash basins, mouth washes, etc., as recommended.

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* Report to the Chemical, Metallurgical and Mining Society.

Some New Companies.

Gaston, Wilkinson, Ltd., Marshall and Loveday Streets, Johannesburg. Company formed to trade as dealers in motor cars and accessories, shippers and indenters into branch houses in London, Paris and New York. Managing director: Walter Wilkinson. Secretary: R. Solomon. Capital: £60,000.

Wool-Growers Manufacturing Co., Ltd., Capetown. Company formed to manufacture woollen goods. Directors: L. G. Abbott, S. Morton, C. E. Manley and F. E. Wilson. Capital: £300,000.

Ross Properties, Ltd., Benoni. Company formed to trade as property speculators. Chairman: Dr. R. A. Ross. Secretaries: Sherwood & Smulian, Ltd. Capital: £15,000.

The Sundry Products (S.A.), Ltd., Norwich Union Buildings, Johannesburg. Company formed to manufacture paints, distempers, etc. Chairman: J. L. Wides. Secretaries: Windram, Smith & Liebenson, Ltd. Capital: £1,500.

McNamara Shot Drills, Ltd., Farrar Buildings, Johannesburg. Chairman: W. H. Haig. Managing director: A. McNamara. Secretary: H. G. Rodd. Capital: £22,000.

Sydney Clow & Co., Ltd., 12 Simmonds Street, Johannesburg. Company formed to trade as importers of Maxwell and Lexington (American) and Star (English) motor cars. Managing director: H. T. Elliott, Brakpan. Secretary: J. T. Lowrie.

THE WEEK IN THE SHAREMARKET.

Quiet with Less Business—Anglo Americans and "C.M.S."—Frank Smith Reconstruction.

QUIETNESS has been the keynote of the week, the fears of labour troubles and the news from Europe being the chief causes. Intrinsically, the market is sound, and is bound to respond to any good news regarding the general situation. All the leading gold stocks remain quiet at lower quotations, and will doubtless remain so until the industrial outlook is better. The pending amalgamation of the Anglo-American and Consolidated Mines Selection is being much discussed, but the official details are not yet available. The Frank Smith reconstruction scheme has been approved by the Courts in England, and the date of closing the books for registration is now announced. The two new oil ventures have proved somewhat disappointing, and have affected the popularity of South African Oils, which are, however, recovering. The fact that Mr. W. T. Anderson has joined the board of this company and that other qualified experts are enthusiastic about its merits should outweigh the prevailing lack of interest. In Transvaal Silvers business has been small at steady prices, awaiting the issue of the scrip for shares and rights. Letters of allotment continue to be dealt in at from 55s. to 60s. It is understood that the scrip will be ready soon after the end of the month. Nothing has been heard of the other projected silver flotations, but they are doubtless awaiting the coming of more favourable markets. Gold, silver and base metals all continue to soar upwards, and the latest quotations from London are the highest yet reached. The price of diamonds, likewise, continues on the up grade, and this has to be taken into account in regard to the quotations for all diamond shares. De Beers had a spurt recently on their introduction on the American market, but the general easing off, consequent on the bad news from Russia, caused a reaction. The railway trouble in England seems to be definitely fixed up, and this removes one of the worst clouds on the horizon as far as the London market is concerned. The week's changes are as follow:—

	Fri., 16th.	Sat., 17th.	Mon., 19th.	Tues., 20th.	Wed., 21st.	Thurs., 22nd.
African Farms	—	15 3*	15 0*	15 0*	15 3*	15 5*
Anglo-Americans	55 6	54 6	55 0	54 3*	53 0	52 6
Apex Mines	7 3	—	—	—	—	—
Aurora Wests	—	—	—	5 0*	—	—
Bantjes Cons.	4 3	4 0*	4 3	4 3*	4 3	4 1*
Blaauwbosch Diamonds ...	—	—	—	—	—	80 0†
Brakpan Mines	72 0†	—	—	—	70 0†	70 0†
Breyten Collieries	8 0*	—	8 0*	—	8 0*	8 3*
Brick and Potteries	4 0*	4 6*	4 6*	4 6*	—	4 6*
British South Africa	—	—	—	23 0*	23 0B	22 0†
Bushveld Tins...	1 6*	1 4*	2 0*	—	1 6*	1 10*
Cassel Coals...	30 0*	30 0*	30 0*		30 0*	30 0
Cinderella Cons	7 0	7 6†	7 0	7 0*		7 0*
City and Suburbans	7 0*	7 3*	7 3	7 3*	7 3	7 6
City Deeps	—	61 0†	61 6†	—	—	63 0†
Clydesdale Collieries	27 0*	27 0*	27 0*	26 6*	29 0†	26 0*
Cons. Investment	34 0*	34 0*	34 0*	34 0*	33 9*	34 0*
Cons. Langlaagtes...	23 0	23 0†	23 0†	21 0*	21 0*	—
Cons. Main Reefs	14 0	13 6*	13 6*	13 9	14 0†	13 6*
Cons. Mines Selection ...	—	—	—		28 0*	30 0*
Coronation Collieries	70 0†	70 0†	70 0†	70 0†	—	—
Coronation Freeholds ...	2 4*	2 0*	2 6†	2 6†	2 6	2 4*
Coronation Syndicates ...	12 6*	—	11 6*	15 0	16 0	—
Crown Diamonds...	14 3	14 6	15 0	15 6	15 3	15 0
Crown Mines	67 6*	65 0	64 0*	67 0*	66 0	66 0*
Daggafontein Mines	19 6†	18 6*	20 0	20 0	19 0*	19 6*
Do. Options (4 years)	1 3	1 3†	1 0*		1 6*	1 3
East Rand Coals	—	2 6*	2 6	2 6	2 6*	2 6*
East Rand Deeps	1 1*	1 1*	1 3*	—	1 1*	—
East Rand Props.	9 6*	9 6	10 0	9 8*	9 8	9 6*
Eastern Golds	1 6*	1 6*	1 6*	1 6*	1 7*	1 7
Ferreira Deeps	—	12 6†	12 6†	—	—	—
Frank Smith Diamonds..	11 6	11 4*	12 3	12 3	12 0	11 9
Geduld Props.	51 6*	51 3	53 0	53 6	53 6†	52 6*
Glencoe Collieries	5 0*	5 9*	—			—
Glynn's Lydenburgs	18 0†	18 0†	18 6†	16 0*	18 0†	19 0†
Jhb. Board of Executors	35 0*	35 0*	35 0*	35 0*	35 0*	35 0*
Jupiters	5 9	5 1	5 0*	5 3*	5 3*	5 3*
Klerksdorp Props....	2 1	2 0*	2 0*	2 1*	2 1*	—
Government Areas	94 0	95 6	96 9	97 6	97 3	97 6
Knight Centrals	6 4*	6 4*	6 8	6 9	6 9*	6 8*

	Fri., 16th.	Sat., 17th.	Mon., 19th.	Tues., 20th.	Wed., 21st.	Thurs., 22nd.
Knights Deeps	9 0*	9 0*	9 0*	9 0*	—	9 0*
Leeuwpoort Tins	30 0	30 0	30 9	30 9	31 3	31 3
Leeuwpoort Tins	30 0	30 0*	30 9	30 9	31 3	31 3
Lydenburg Farms	7 9*	8 2†	7 9	7 9*	8 0	7 9*
Middelvlei Estates...	2 4†	2 3†	2 3†	2 3†	2 3†	2 3†
Modder B.	165 0*	163 0	167 0	164 0	162 0	162 0
Modder Deeps	51 6	51 3	53 0	52 9	52 0	51 6
Modder Easts	28 6*	27 3	29 ·3	28 10½	29 0	29 0
Do. Options (3 years)	8 6*	7 9	8 9	8 6	8 6*	8 8
Do. Options (4 years)	11 5	10 3	11 7	11 0	11 4	11 6*
Hume Pipes...	20 6	20 3*	21 0	21 0*	22 0	22 0
New Boksburgs	—	2 3	2 0	2 0	—	—
New Eland Diamonds ...	—	84 0†	84 0†	84 0†	83 0†	75 0*
New Era Cons.	9 4½	—	9 6	9 6*	9 9	9 9*
New Geduld Deeps	2 1*	2 1*	2 2*	2 0*	2 0*	2 0*
New Heriots	—	—	10 0†	10 0†	—	—
New Kleinfonteins	11 9	11 3	12 3	12 6	12 0	12 6
New Modders	£32¼	£32A	£32½	£32A	£31⅝*	£31½*
New Primrose	2 9*	3 9*	4 0*	6 0†	6 0†	—
New Unifieds	6 0†	5 0*	—	5 0*	5 9†	6 0†
Nigels	6 6*	—	6 6*	7 0*	7 0*	7 0*
Nourse Mines	12 0*	12 9*	13 6*	13 0*	13 6*	14 3*
New State Areas	27 9*	27 9	28 0*	28 0	28 6	28 9A
National Bank...	—	£14⅞†	—	—	—	£14⅞†
Pretoria Cements	96 6	97 6	98 6*	96 0*	96 6	96 6
Princess Estates	2 9*	2 9*	2 9	2 9*	2 9*	—
Rand Collieries	—	3 9*	3 9	3 9*	3 9*	3 9*
Rand Nucleus	—	—	2 0*	—	—	2 1
Rand Selections	104 0	105 0	104 6	103 0	102 0	102 0
Randfontein Deeps	6 6	6 3*	6 6*	6 9	6 6*	6 9†
Randfontein Estates	23 3	22 9*	23 6*	23 6	23 0	23 0
Rouxville Diamonds	26 9	25 6	25 0*	25 6	24 6*	24 6
Roberts Victors...	19 0	18 6	—	19 6	19 0	18 0*
Rooibergs	10 0	10 6*	10 9	10 6	—	10 3*
Roodepoort Uniteds	—	—	7 0†	—	4 0*	7 0†
Ryan Nigels	4 6†	—	—	—	—	—
Shebas	2 0*	2 3	—	2 6*	2 6*	2 6*
Simmer Deeps	3 0*	3 3	3 0*	3 0*	3 0*	3 6†
S.A. Lands	6 3	6 0*	6 1	6 1	6 1	6 1*
Springs Mines	55 9	55 3	57 3	—	56 9	56 6
Sub Nigels	17 0*	17 6	17 6*	17 6	17 6	17 3
Swaziland Tins	12 6*	13 0*	13 0*	15 0*	15 0	—
Southern Van Ryn	7 0*	7 6†	7 0	7 0*	—	7 0†
S.A. Alkalis	25 3*	25 3*	26 0	26 6	26 6	26 0*
Transvaal G.M. Estates	16 6	16 6	16 6*	17 6*	17 6*	16 6*
Tudors	—	—	—	—	—	1 5*
Van Ryn Deeps	92 9	92 6	95 0	94 6	93 9	93 6
Village Deeps	16 0†	13 0A	—	14 0*	14 0*	14 6*
Village Main Reefs	—	—	—	—	—	8 6†
Victory Monarchs	45 0	45 0*	45 0*	45 0*	45 0*	45 0*
West Rand Cons.	8 0†	—	—	—	—	—
Western Rand Estates ...	9 0	8 9*	8 9	8 3*	—	9 3†
Witwatersrands...	17 6*	—	—	17 6*	17 6*	—
Wit. Deeps	10 0	10 0*	9 9*	8 6*	9 6†	9 9†
Wolhuters	4 9*	5 6*	—	5 0*	5 0*	5 1
West Springs	23 6	23 3	23 9	23 9	23 3	23 9
Do. Options	8 6	8 0	8 3	8 0	8 0	8 3
Zaaiplaats Tins	12 0	12 0	12 3	12 0	11 9*	11 6

Union 5 per cent. had buyers at £104¼; Union 4½ per cent. had buyers at £104¼; Union 5 per cent. (taxable) had buyers at £102½.

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*Buyers. †Sellers. AOdd lots. BEx London.

ANSWERS TO CORRESPONDENTS.

All enquiries addressed to the Editor must bear the writer's name and full address. We cannot reply to enquiries by letter, but telegrams with replies prepaid will be answered. Correspondents are requested to write their names and pseudonyms distinctly.

"P. P."—Better leave the venture alone.

"Anxious."—We do not advise you to sacrifice at to-day's low figure.

"W. H. L."—In liquidation.

"Once Bitten."—Your letter is libellous.

"T. R." (Bulawayo).—The gold mining shares you mention are the pick of the market, and the industrial is a gilt-edged investment.

Victory Monarch.

The following is a recent statement of the position of the Victory Monarch Company submitted to the board of directors:—Machinery: This is all erected, except the tube mills, and working at full crushing capacity. The manager considers he can put through 2,500 tons per month and have an average recovery of 8 dwts. per ton, being not less than £5,000 per month taking gold at £5 per oz. When the mills are erected 6,000 tons per month will be crushed. Our expenses, including development are approximately £2,000 per month, so that even without the tube mills a handsome profit will be shown. We consider that it can be definitely stated that the whole 9,000 feet strike will go down to at least the 500 feet level proved in the main block, as the Francis is now 175 down, and is improving as they are going down; the Amelia is down 84, and the same remark applies to this. The average width is 45 in., but for the purpose of estimating the tonnage we have calculated on a basis of 30 in. only, so as to bring our estimate well within the limit of probable tonnage. This will give 937,000 tons of an average value as follows: Francis block, 12 dwts. (a drive put in at 120 ft. level shows 12 dwts., 49 in.; 14 dwts., 49 in.; 18 dwts., 56 in.; 28 dwts., 56 in.; 60 dwts., 52 in.). Amelia block, 9 dwts. (a drive put in at 60 ft. shows 10 dwts. over 78 in.). Central block, 8 dwts. Main block, 6·85 dwts.—making an average of as near as possible 9 dwts., giving a total value at the standard price of gold of £1,770,930. It is estimated that the limit of unpayable reef will be 25 per cent., leaving a nett balance of £1,328,198, or £1,750,000 at the current market value of gold. Taking your working costs at 18s. per ton (our present cost is about 15s. per ton, but provision must be made for a possible increase), it leaves you an estimated profit of £695,723 at standard value, or £1,017,373 at present market value of gold. When the tube mills are erected 72,000 tons per annum can be crushed; it will therefore take 10 years to crush the 937,000 tons less 25 per cent. In addition, the present reef in the Main block is 104 in. and assays 7·4 dwts. at 500 ft., and there is every indication that the reef will go to a much greater depth. The above blocks represent 40 claims, Tati Concession size, approximately 60 Rand claims. Your other 80 claims have not been developed and proved, so we leave that entirely out of our calculation.

Zambesia Mining Development, Ltd.

This company is, it may be remembered, a subsidiary of the Portuguese Zambesia Company (neither of which must be confused with the Zambesia Exploring Company, Ltd., under quite different control) and was formed in 1911 to develop the mining areas over a tract of some 35,000 square miles in Portuguese East Africa. Unfortunately the War practically suspended the company's activities, so that the accounts for the five years ended December 31, 1918, submitted at the meetings held recently, showed no material change in the financial position since the outbreak of hostilities. The exhaustive statement by the chairman, Sir Alfred Sharpe, K.C.M.G., C.B., summarised elsewhere in this issue, shows, however, that work is now to be renewed with redoubled zest. The speaker gave an interesting historical review of reports on the extensive coal and other deposits from Dr. Livingstone, writing in the middle of last century, up to present times. "We feel (he added) that under the new conditions the demand for new coalfields, the coming construction of the Beira-Zambesi railway, which will bring our nearest (easternmost) coal seams within some 20 miles of rail carriage and the connection of the district with Beira, one of the best ports in South-East Africa, the time has come for sound detailed investigation and exploitation." The services of first-class experts have been secured and the funds obtained by calling up the unpaid balance on the company's shares are to be concentrated in the first place on the coal deposits. Gold, copper, etc., can wait, or possibly be taken up independently.

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TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

The Great Question of Exchanges—Commercial Affairs—High Prices of Forage and Products—Iron, Steel and Machinery—Oils, Colours and Paints—Various Trade Notes.

It is to be hoped that something definite will result from the present discussion in reference to the exchanges as affecting South Africa. There are no doubt many pros and cons regarding such an intricate subject of high finance. The general idea is that gold can be sent direct to America to counterbalance any adverse exchange. It must be borne in mind that an English sovereign as represented by the gold coin is worth about 26s. in New York. But it is the English paper money that is only worth about 15s. A public meeting would no doubt elicit much knowledge and so correct the many erroneous ideas floating about into something like a common sense view of such an important subject. It was hardly fair of the Government to call together a lot of authorities at Pretoria and then not give the essence of their deliberations to the public. Certainly the Governments have been caught napping over their money order business between here and America. Another view of the whole question is that the manufacturers of America are beginning to feel the bad effects of the big exchange now current, and the financiers are waking up and recognising the importance of doing something, and maybe this will be a great incentive for the American Government to sign the Peace Treaty and establish the League of Nations. Naturally this has thrown South African business into English channels, much to the chagrin of the American and Canadian manufacturers, who established a good business with us during the War period and naturally are not going to lose it without an effort, as not only have we a big ready-money business for those who are clever enough to send us the right goods at the right price, but no doubt this is very much assisted by the halo that surrounds our wonderful output of diamonds and gold. In talking this matter over with a commercial broker, he considers that Britain has become normal again providing the sovereign is reckoned at 15s.; and now the labour troubles there are a little more settled the outputs for all kinds of goods are gradually increasing. This eventually means that Belgium and other European places will come on again in competition in the world's markets. Doubtless that stage of competition will arrive amongst the different countries, but it will take some time, although even much can be done in the latter part of 1920. Then look out for reasonable values when trade competitions and trade jealousies are resumed in very earnest. Since writing the above Reuter has sent a long speech on the subject of the South African exchange by Mr. Jagger, M.L.A., of Capetown. Mr. Jagger has brought a lot of business acumen to bear on the position, as he practically says: take your sovereigns to America and purchase what you want, as we are a creditor country throughout the world and therefore we are in the grand position of trading direct and paying direct (not through London) with any part of the world. The idea of soon having our own mint, from Mr. Jagger's point of view, is not very rosy, as we cannot coin sovereigns at just under £4 per oz. when we have to pay £5 per oz. for the raw gold. Mr. Jagger does not agree with Mr. Reynolds' and Sir Evelyn Wallers' plan of issuing inconvertible paper currency backed by actual gold in the Government vaults. These giants of finance have given much thought and study to the subject, and there must of necessity be many others; therefore, as previously remarked, public meetings should be arranged to thrash out and enlighten us on so important a matter, especially when Mr. Jagger makes the statement that the increased prices the world over were due not so much to a decrease in production, but mainly to excessive issues of paper money.

Commercial Exchange.

In an interview with a buyer the question arose as to the shortage of stocks for the mines. He said that so far it was rather surprising the number of tenders they were receiving from the Johannesburg merchants for the various indents posted in the Exchange. He did not know how long it would last as the merchants tell him that very small consignments are dribbling through instead of what might be termed bulk consignments. What was worrying him more to-day was the price of forage and mealies for the horses, as forage at 17s. per 100 lbs. was altogether far and away beyond their forecast of outlay. Again the mealie meal, meat, and other things required at the Kaffir compounds were extremely high, and that position was a troubling one, but they could only hope for the best and maybe some assistance from the Government now that that body had moved in assisting the wheat and flour question. In the meantime his group would go on as carefully and judiciously as the day-to-day position warranted. There is quite a good demand from Bloemhof and the diamond fields in that district. It appears that Bloemhof is improving from a transport point of view, as this is the chief depôt for postal, telegraph, and cartage arrangements. The smaller kind of digging tools and small washing machinery is ever on the move through Bloemhof, not forgetting quantities of foodstuffs as well. Picks are 65s. per doz.; shovels, American, 60s.; and English, 75s. per doz. Wheelbarrows per dozen are 62s. 6d. each, but if a single one is wanted 67s. 6d. is asked. Although the mines are not giving many orders just now, there are good inquiries from the Belgian Congo, Rhodesia and the Northern Transvaal for all kinds of mining material and oddments of all kinds, therefore there is a certain amount of activity on the Exchange.

'Phone 4673. Box 3162.

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TIMBER AND BUILDING MATERIAL.

All prices are very firm with an advancing tendency, but it is rather difficult to gauge the stocks of deals and Baltic timber. In Johannesburg the price of deals is 1s. 10d. to 1s. 11d.; floorings, 10d.; ceilings, 6½d. to 7d. per ft.; Oregon pine, 9s. 6d.; and pitch, 10s. 6d. per cube; shelong, 1s. 3d. per ft.; and beaver board, 5d. a square. Roofing iron is 1s. 7d. up to 10 ft., and 1s. 7½d. to 1s. 8d. beyond. The latest cables state that new corrugated iron has risen to £48 per ton in England, costing landed in Johannesburg about 1s. 5¼d. per ft. Flat galvanised iron, 22, 24 and 26 gauges, is 55s. to 60s. per 100 lbs. This also comes dearer from England and cannot be landed here under £50 per ton. All builders' hardware is fairly plentiful in most stores, but the assortment varies. Values are up approximately 10 per cent. from the beginning of the year. For example, 6 ft. porcelain baths were £13 10s. last year, but are now £15, which item should give a very fair idea of the increase in sanitary ware and similar requirements. Locks are one of the things which have not risen at present, although the price in England has advanced. Steel ceilings are fairly plentiful at 80s. per square instead of 45s. in pre-War days. Secondhand building material is in excellent demand, but stocks are on a very meagre scale; the fact is that although there is such a good demand the actual business done is quite on the poor side, as it is so difficult to obtain anything like substantial supplies, and whatever is got has to be very dearly paid because of the excessive competition amongst the dealers themselves.

IRON, STEEL AND MACHINERY.

Business has not been quite so good in the iron and steel bar trade as last week; whether the unsettling state of strike fears has anything to do with it, it is difficult to say. The market for copper and brass sheets in town is good, but there is no quotable difference in values, although there is a firmer tendency, as merchants are buying from one another. The price of rails is £15 per ton for those only good enough to reinforce concrete. The better class suitable for tram tracks and prepared for such are £20 to £22 per ton for 12's, 14's and 16's. Good 20 lb. rails are worth £25 per ton, but for some reason or another the demand for 24 lb. rails is anything but brisk. It is very difficult to replace good second-hand rails, and as the yards are being sorted over so often the best stuff is now seldom seen, and the stacks when sold have a good many marked off in chalk as unsuitable through the variation of crowns and such like. Loco-type boilers are in constant demand for brick works, agriculturists and for small mines and factories. As regards factories, something was said about larger boilers being often required to bring the plants up to Municipal regulations. Brick and tile machinery is also wanted and there is a big demand for flour machinery. A coast buyer was here during the week to purchase six sets of roller mills, but was unsuccessful. The party giving this information says there are no new roller mills in Johannesburg and he thinks very few in any part of the Union. All the engineering shops and second-hand machinery yards are quite busy, not only on repairs but in making new parts for those worn out or damaged.

OILS, COLOURS, PAINTS AND BRUSHWARE.

From a mid-monthly trade circular issued by a leading distributing house we note the following, viz.: The caption is "Prices are still advancing." Latest cables advise: White lead is now £71 15s. in England; market firm. Local price remains for the present at 95s. per 100 lbs. Linseed oil: Cable price is 9s. 4d. per gallon in England. Over 1,600,000 gallons have been supplied to Germany since the Armistice in exchange for potash. This and the large demand from the Continent, also the shortage of the seed crop, accounts for the high price now ruling. To-day's quotations are: 14s. per 7 lb. tin (1 O.M. gall.); 70s. per 4 Imp. gall. drum (37 lbs.). Turpentine: Prices are still on the upward course. The latest price given in New York

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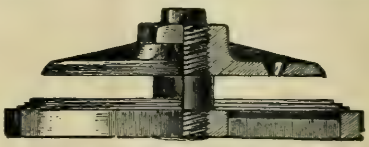

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is 22 dollars 44 cents per case. The prohibitive exchange will make this land at a very high price. Local quotations: 15s. 6d. per tin, 5-6 Imp. gall.; 152s. 6d. per case, 10 tins; 125s. per case, 2/4 Imp. gall case. Brushware: Russian bristles are now unprocurable. Chinese bristles are realising very high prices. Red oxide in oil, 90s. per 100 lbs.; 25 lb. kegs, 25s.; 12½ lb. kegs, 12s. 6d. Dry burnt sienna, 1s. 6d. per lb.; raw sienna, dry, 1s. 6d. per lb.; dry Indian red, 1s. 3d. per lb.; anti-corrosive roof paint, 17s. 6d. per 14 lb. tin, 85s. per 70 lb. drum; patent bridle, 8s.; brush, 19s. 6d. each; black bristle wall brushes, 4 in. 12s. 6d. each, 4½ in. 15s. each; varnish, 22s. 6d. per gall.; stencil brushes, No. 2 1s. each, No. 4 1s. 6d. each, No. 6 2s. 6d. each, No. 8 3s. 6d. each, No. 10 4s. 6d. each; paperhanger's brushes, 8 in. 10s. 6d. each, 10 in. 12s. 6d. each. A quantity of 1920 wallpapers has already arrived here and a further shipment is now due. Wallpapers advanced 20 per cent. in England last week. Muralo: Fresh stocks are due at the end of the present month. Present prises are 36s. per case; 8s. 7d. 1 lb. packets. Clients are advised, in view of enormous demand for all above lines, to keep their stocks up to normal, as no possibility is seen of prices falling for some time to come.

ELECTRICAL GOODS.

There is not much difference to report in the electrical goods market, except that the word has gone forth that lamps are going to rise, which is not at all surprising in view of the prices ruling oversea. As a matter of fact, electrical goods generally have all a hardening tendency. Ceiling roses and adaptors are still scarce and, according to all accounts, are likely to remain so for some considerable time. Wiring and tubing, on the other hand, are fairly plentiful and good supplies of these are already on the water, but when these have been exhausted, which is probable about the end of March, prospects of replenishment are not too encouraging. One prominent dealer, in reviewing the general position, said that in his opinion and in that of the more important merchants in town there could be no doubt whatever that prices for electrical goods, which had gone down somewhat since the Armistice, would rise to considerably higher levels than had yet been seen in Johannesburg; in fact he had been told by one in a position to know to buy all he could now and he would make money.

VARIOUS TRADE NOTES.

Cartage contractors are not busy and unfortunately the forage and other horse feed are so very expensive. In the street it was noticed that four large timber wagons contained tram rails for the Broken Hill mines in Rhodesia. The property market is duller and the opinions are that not much will be doing until after the elections on March 10th This no doubt will apply pretty much to all trades, and especially the speculative element. If there is no strike, and the elections favour the Government, then excellent times are predicted. Bricks are unobtainable for immediate delivery and the price of ordinary stock bricks is quite 80s. per 1,000, being about double the price in pre-War days.

The Lonely Mine.

The following are particulars of output of gold, etc., from the Lonely mine for the month of December, 1919:—Mill ran 696 hours; crushed 4,600 tons; fine gold recovered, 2,177·450 ozs., value £9,163 4s.; slimes treated, 4,600 tons; fine gold recovered, 3,859·042 ozs., value £16,241 1s. 7d.; total fine gold, 6,063·492 ozs.; total value, £25,404 5s. 7d.; profit, £12,512 10s.

Rooiberg Quarterly Report.

The report of the directors for the quarter ended 31st December, 1919, states:—Ore treatment: Days (24 hours) worked: Mill, nil; treatment plant, 63·43; stock slime and sand re-treated, 6,110 short tons; alluvial, tons sluiced, 11,576 short tons; concentrates produced, 32 long tons; average assay value of concentrates, 59·76 per cent. M.T. Revenue and expenditure: Estimated revenue, £8,443; expenditure, £12,133.

Z 10

W. & W.
MELB.

The Products of the Zinc Producers of Australia are now available to users in South Africa, and those interested are invited to get into communication with the Zinc Producers' Association Proprietary Ltd. at either of the addresses given at the foot of this announcement.

The Association is prepared to supply the following:—

Electrolytic Zinc (A-Z) Brand
Containing about 99.95 % Metallic Zinc
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Proprietary Limited
Collins House, 360 Collins Street
Melbourne, Australia

London Address
Pinners Hall
Austin Friars
London, E.C. 2

Cable Addresses
Zincdom, Melbourne
Paystreak, London

Latest Company Registrations.

The following is the list of companies registered during December, 1919:—

Rand Farmers' Suppliers, Ltd., 46 Delvers Street, corner Commissioner Street, Johannesburg; capital £1,000.

The Jeppe Union Furnishing Company, Ltd., 29 Main Street, Jeppestown, Johannesburg; capital £5,000.

Langlaagte Bioscope, Ltd., Main Reef Road, Crown Mines, Tram Terminus, Langlaagte; capital £750.

J. Hobson & Company, Ltd., 412 and 413 Fourth Floor, Consolidated Buildings, Harrison Street, Johannesburg; capital £1,000.

Samuel Osborn (South Africa), Ltd., 11 and 12 Hosken's Buildings, corner Fox and Rissik Streets, Johannesburg; capital £40,000.

Barratt & Pillans, Ltd., corner Union and Third Streets, Krugersdorp; capital £10,000.

Eastern Transvaal Coal Agency, Ltd., 14 New Court Buildings, 84 Market Street, Johannesburg; capital £500.

The Rosary Estate, Ltd., 113/117 Exploration Buildings, Commissioner Street, Johannesburg; capital £400.

Ashwins, Ltd., 14 Bureau Lane, Pretoria; capital £10,000.

De Reszke Agencies, Ltd., 95 Market Street, Johannesburg; capital £2,500.

Ulster Estates, Ltd., care G. I. Hoffman & Company, Ltd., Grosvenor Chambers, 36a Loveday Street, Johannesburg; capital £200.

Standard Bar and Buffet, Ltd., Aegis Buildings, 32 Loveday Street, Johannesburg; capital £10,000.

United African Diamonds, Ltd., 15 Tudor Chambers, Church Street, Pretoria; capital £20,000.

Fairlands Estates, Ltd., Crown Street, Barberton; capital £3,000.

Louis de Leeuw, Ltd., 5 Beckett's Buildings, corner President and Harrison Streets, Johannesburg; capital £1,000.

Taylor & Morkel, Ltd., 65 President Street, Johannesburg; capital £10,000.

The Ballindalloch Company, Ltd., Second Floor, Meischke's Buildings, corner Market and Harrison Streets, Johannesburg; capital £20,000.

Niven & Mitchell, Ltd., 11 General Mining Buildings, Holland Street, Johannesburg; capital £2,500.

The Frank Seymour Agencies, Ltd., 81 Exploration Buildings, Commissioner Street, Johannesburg; capital £2,000.

African Mica, Ltd., 3 and 4 Norwich Union Buildings, Fox Street, Johannesburg; capital £2,000.

Consolidated Metal Products, Ltd., Express Buildings, 65 and 67 Delvers Street, Johannesburg; capital £8,000.

Star Confectioney, Ltd., 30 Beaufort Street, Troyeville, Johannesburg; capital £4,000.

Lardine, Ltd., Young & Young, Cold Storage Works, Germiston; capital £40,000.

The Brakpan Hotels, Ltd., 43 Cranbourne Avenue, Benoni; capital £10,000.

Drew & Rees, Ltd., Mutual Buildings, corner Harrison and Commissioner Streets, Johannesburg; capital £2,500.

Vryheid Motor Company, Ltd., 45 Standard Bank Chambers, Johannesburg; capital £5,000.

Commercial Properties, Ltd., 280 Vermeulen Street, Pretoria; capital £10,000.

FOREIGN COMPANIES.

New Consolidated Gold Fields, Ltd., care D. Christopherson, and/or Lieut.-Col. F. L. Brown, and/or C. Hely-Hutchinson, all of First Floor, Consolidated Gold Fields Buildings, Simmonds Street, Johannesburg; capital £4,500,000.

Percy Diamonds, Ltd., care T. E. Duckles, 119/120 Stock Exchange Buildings, Johannesburg; capital £12,500.

The African Oil Corporation, Ltd., care George Perrem, 11/17 Trust Buildings, Fox Street, Johannesburg; capital £100,000.

ALTERATIONS AND ADDITIONS TO FOREIGN COMPANIES.

Theron Diamonds, Ltd., Johannesburg.

Transvaal Exploring Land and Minerals Company, Ltd., Johannesburg.

Pretoria Estates, Ltd., Johannesburg.

PROSPECTUSES.

Mountain Mines, Ltd., Johannesburg.

Transvaal Silver and Base Metals, Ltd., Johannesburg.

African Beverage Company, Ltd., Johannesburg.

NOTICES OF INCREASE AND DECREASE OF CAPITAL.

Orion Diamond Mining Company, Ltd., Johannesburg; increased from £10,000 to £30,000.

Moonstone Diamond Syndicate, Ltd., Johannesburg; increased from £500 to £3,000.

Simpsons (South Africa), Ltd., Johannesburg; increased from £1,500 to £10,000.

Geduld Proprietary Mines, Ltd., Johannesburg; increased from £1,152,900 to £1,175,000.

Glenny & Company, Ltd., Johannesburg; increased from £3,000 to £20,000.

Northern Manufacturing Company, Ltd., Johannesburg; increased from £400 to £2,000.

Rustenburg Citrus Growers, Ltd., Johannesburg; reduced from £30,000 to £18,750.

Zaaiplaats Tin Mining Company, Ltd., Johannesburg; increased from £63,750 to £86,250.

Barbrook Gold Mining Syndicate, Ltd., Barberton; increased from £3,600 to £6,000.

Pretoria Portland Cement Company, Ltd. Pretoria; increased from £300,000 to £360,000.

Rand Mutual Assurance Company, Ltd., Johannesburg; increased from £82,090 to £250,000.

South African Townships, Mining and Finance Corporation, Ltd., Johannesburg; increased from £600,373 to £974,616.

Ebrahim & Omar Rajan, Ltd., Zeerust; increased from £1,000 to £2,000.

COMPANIES IN LIQUIDATION.

Underwriters, Ltd., Johannesburg; capital £2,000.

South African Horse Shoe Manufacturing Company, Ltd., Pretoria; capital £4,000.

Transvaal Graphite Mining and Manufacturing Company, Ltd., Johannesburg; capital £10,000.

Mac Mac Central Prospecting and Gold Mining Company, Ltd., Johannesburg; capital £25,000.

Transvaal Diamond Development Company, Ltd., Johannesburg; capital £50,000.

United African Timbers Corporation, Ltd., Johannesburg; capital £10,000.

United Industries, Ltd., Johannesburg; capital £500.

Alkali Exploration Syndicate, Ltd., Johannesburg; capital £4,000.

South African Gold Mines, Ltd., Johannesburg; capital £179,324.

African Farms, Ltd., Johannesburg; capital £650,000.

Suburban Townships Company, Ltd., Johannesburg; capital £27,500.

Malvern Estates, Ltd., Johannesburg; capital £50,000.

Rhodesia and Union Farms and Mines, Ltd., Johannesburg; capital £67,250.

Smithfield Meat Supply Company, Ltd., Johannesburg; capital £6,000.

Rustenburg Club Company, Ltd., Rustenburg; capital £1,875.

Argue & Company, Ltd., Johannesburg; capital £ ,000.

Argus & Company, Ltd., Johannesburg; capital £5,000.

GLYNN'S LYDENBURG, LIMITED

(Incorporated in the Transvaal)

Declaration of Dividend No. 37

A Dividend of 7½ per cent. (1s. 6d. per Share) has been declared by the Board for the period ending January 31, 1920, payable to Shareholders registered in the Books of the Company at the close of business on January 31, 1920.

The Transfer Books will be Closed from February 1st to 7th, 1920, both days inclusive.

It is hoped to post the Warrants in Payment of this Dividend on or about March 6, 1920.

Warrants despatched from the London Office to persons resident in the United Kingdom will be subject to a deduction of English Income Tax.

By Order of the Board.

TRANSVAAL CONSOLIDATED LAND AND EXPLORATION COMPANY LIMITED, Secretaries.

Per J. H. E. WILSON.

Head Office:
The Corner House,
Johannesburg, January 21, 1920.

THE

CASSEL COAL COMPANY,

LIMITED.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Twenty-Second Ordinary General Meeting of Shareholders in the above Company will be held on TUESDAY, MARCH 30, 1920, at 11.15 a.m., in the Board Room, Lace Building, Johannesburg, for the following purposes:—

1. To receive and consider the Balance Sheet, Profit and Loss Accounts, and Directors' and Auditors' Reports for the year ended December 31, 1919.
2. To elect two Directors in place of Messrs. W. Ross and L. Edwards, who retire in rotation, but being eligible offer themselves for re-election.
3. To appoint Auditors for the ensuing year, and to fix the remuneration of the Auditors for their past services.
4. General Business.

The Transfer Books of the Company will be Closed from the 23rd to the 30th March, 1920, both days inclusive.

By Order of the Board,

T. L. DAY, Secretary.

Lace Building,
74, Fox Street, Johannesburg
20th January, 1920

ENGINEERING SECTION.

THE UNPROGRESSIVE LOAD TARIFF FACTOR OF THE V.F.P.

A Reduction from 70 per cent. to 50 per cent. Urged to Extend Use of Electricity on the Far East Rand.

At the December meeting of the S.A. Institute of Electrical Engineers, Mr. E. V. Perrow, in discussing Mr. H. W. Clayden's paper, said: "Like previous speakers on this subject, I think the Institute is to be congratulated upon having such a paper as Mr. Clayden has given us. I certainly disagree with the opinion expressed that such subjects as the tariffs for electric power supply are not fit and proper subjects for our Institute to discuss. We are in the position on these fields of having a power supply system with practically no competition, and, if through this or other causes, this concern cannot see to what extent it is hampering the expansion of the electrical industry in this district, then it is the duty of this Institute to show it not only that it is doing so, but, if possible, the way in which it can help the mining and other industries as well as probably considerably increasing its output and consequently further reducing its charges. We are, I think, sir, but following precedents set by similar institutions in discussing the financial aspects of power supply, and I am of the opinion that a result of the discussion should have a profitable outcome. As pointed out by the author, at its very best a mine load is essentially a fluctuating one with the period of maximum demand occurring between 8 a.m. and 2.30 p.m. on six days of the week; it is interesting to note, however, that Mr. Bernard Price in his address before this Institute in February, 1915 (see Vol. VI., page 46, Fig. 4), shows a load factor curve giving a figure for the system of 72·5 per cent. with the mines working single shift as at present and the supply to the mining industry representing approximately 99 per cent. of the supply company's output. Defining group peak load the author, on page 174, says, 'The sum of the maximum readings over any one hour for all the mines of the group are taken as the group peak load for that month.' I would like to ask if this is correct, as it appears to me that it should read something like the following, 'The group peak load for any month is the maximum hourly load, as indicated by the sums of all the readings of each mine for each hour during the month.' There are various ways of endeavouring to affect improvements in not only group load factor but also individual load factor on the mines, but each has to be carefully investigated from its individual or group bearing on the subject. What suits one mine or group would possibly be useless to others. One hears of mines on which during the period in which the electrically driven compressors are running, milling and consequently tube milling and reduction plant loads are slackened off and as soon as the compressor is shut down the reduction plant is set going full speed ahead; such methods should surely be unnecessary in these enlightened times. The scheme mentioned by the author of increasing the storage capacity for water at the pumping levels underground is quite good and of course is only applicable to new schemes, but should repairs or sudden inrushes of water necessitate running all pumps even for one day shift only, it is quite obvious that the mine would be fairly heavily penalised. Mention has been made by the author and others of the necessity of certain mines having to install their own steam plant, more especially for compressors and winding engines. In such cases it might be feasible to install an electric generating set to carry the peak loads and thus ensure that under any but abnormal circumstances the load factor on the power company's supply would be the required 70 per cent.; this generator could be driven by an exhaust steam turbine deriving steam from the compressors and winding engines in conjunction with a suitable thermal accumulator. This steam would naturally be a maximum amount during the maximum load period and consequently the generating set could be shut down after, say, 3 p.m. each day. By such a scheme the most efficient utilisation of an inefficient arrangement could be made. Working as most of the mines are to-day, very much below the usual complement of native labour, the load factor penalty clause puts an additional burden on these mines for, whereas with plenty of labour the mills are kept running throughout the week-end and thus the load factor kept up to a reasonable figure it is usually necessary now to hang up the mills over a portion of the week-end for want of ore; thus very considerably reducing the load factor of the individual mine and of the group. One speaker mentioned that power was the one commodity for which the mines are not paying more than at the outbreak of War. This may be so in actual practice, but if we consider the question we would probably find that most of the contracts with the various mines were drawn up with a view to a readjustment of rates consequent upon, I suppose, a reduction in operating costs anticipated once the power scheme was got into complete working order. That such a readjustment of rates has not yet materialised does not necessarily mean that the anticipated reductions were not affected, but more than likely the extra cost of materials, labour, etc., have offset such reductions, so that although the cost of power is the same to-day as it was before the War, it is really higher than was expected it would be at the present time. It has been stated that certain contracts with the mines will have to be reviewed at no very distant date. If such is the case, it is to be hoped that this load factor clause will either be eliminated altogether above, say, a 50 per cent. load factor or the penalty made so small as to impose no serious burden on the consumers.

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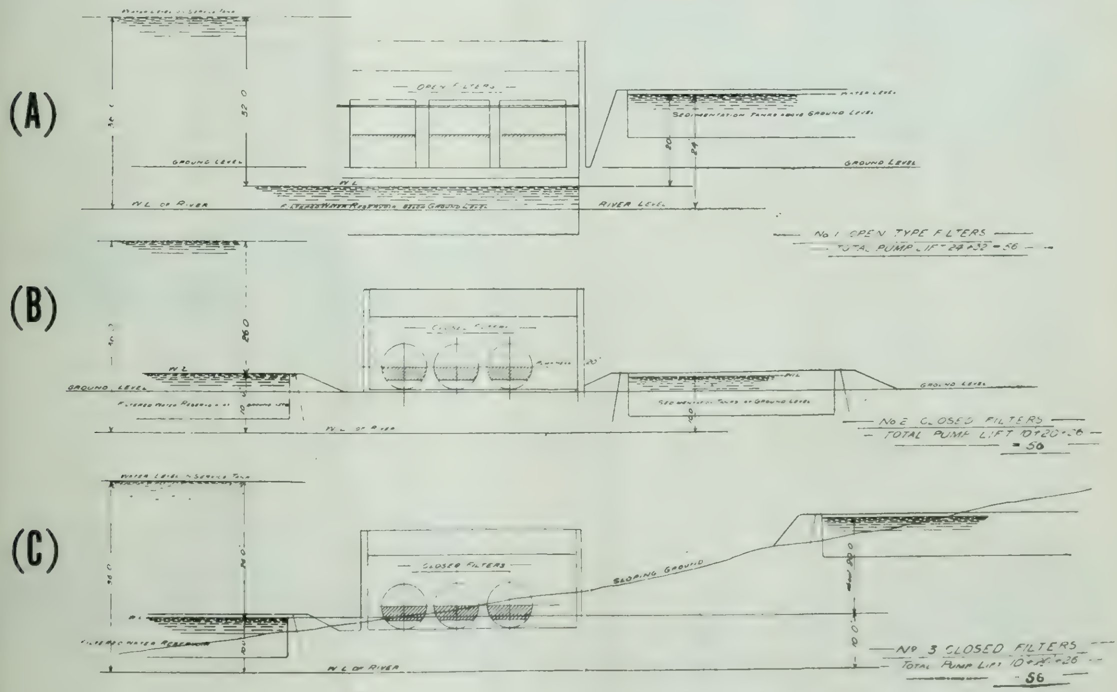
WATER FILTRATION.

Advantages of the Closed Filter as compared with the Open American Type Filter—with some mention of the Constructive Advantages and Disadvantages of various types of Patent Mechanical Filters.

In cases where the ground at the site for a filtration plant has a gradual slope, the head for filtration is provided for by that natural slope by placing the sedimentation tank a short distance up the slope from the site of the filters and clean water tank; but even though the slope of the ground can be made use of in getting a suitable head without it being necessary to elevate by masonry work the sedimentation tanks, it will be readily seen that in the case of open filters the masonry and concrete work for the clean water tank, filters and filterhouse costs considerably more than the arrangement suitable for closed filters, because the top of the open filters must be within two or three feet of the top of the sedimentation tanks and the clean water tank requires to be at a low level to get the necessary filtration head.



DIAGRAMATIC DRAWING SHOWING ARRANGEMENT OF TANKS FOR OPEN AND CLOSED FILTERS

As regards the question of pumping duty in the two systems, when the ground is comparatively level the head for filtration for most closed filters is produced by means of a separate stage of pumping instead of the static head in the American type open filters: in both systems the total loss of head is nearly the same, there being a slight difference, however, the reason for which is hereinafter stated. Figures (A), (B) and (C) show diagrammatically the two systems, arrangements of tanks, and levels, and from these any engineer will at once realise the enormous saving in excavation, masonry and concrete construction by making tanks at the most economical ground level. There is no difference in the total pumping head in the two systems, the only difference being that in the closed type system the filtering head is produced by a separate pump between the sedimentation tank and the filtered water reservoir instead of a static head in the case of the open type filters produced by one pump which discharges the unfiltered water direct to the elevated sedimentation tanks. Controllers are provided in the closed type filter plant to maintain constant flow. It is usually understood that, as the open type of filter necessitates expensive concrete work owing to the level of the tanks, the raising of every foot of sedimentation tank adds very much to the cost, and it is only what one would naturally expect that the makers of this type of filter do all they can to reduce the loss of head as much as possible. With this object in view the filtering material is made as open as possible to reduce the resistance. Also with the open type filters with their system of cleansing, the bed is not of one uniform grade throughout, a coarser material being used in the lower strata. In closed type filters the whole depth of the bed is usually of one uniform grade from top to bottom. The bed, therefore, is less sensitive to changes of flow and pressure of water than in the other filters referred to, and owing to the greater depth of fine material and the density of it the filtering efficiency of the bed is higher. The total cost of installing a filter plant includes necessarily all the masonry and concrete work for the construction of tanks, filtered water reservoir and filter house, and for excavations. The cost of the tank and house would probably form the greater portion of the total estimate, and with the closed filter the cost of this work is considerably less than what it would be with open type filters. The open type filters work on a total filtering head of from 15 to 20 feet, which is very nearly the same as is recommended for the best known closed type filter plants; if a smaller head is only available then a larger area of filter than with a 20 feet head would be necessary. There are other important advantages which ought to carry weight, especially in a hot climate like India or South Africa, where native labour is employed; they are, that the closed filters are not open to contamination by natives nor are they so liable to atmospheric influences which cause vegetable growths.

From the foregoing the difference between the two systems of open and closed filters, and the special advantages of the latter when the site is on a flat ground level should be quite clear. When the ground level is a sloping one and the advantage of the slope can be made use of to give the necessary head, as illustrated in Fig (C), the pump for causing the filtering head is dispensed with.

Rapid Filters.

Although different makers of patent mechanical filters, either open or closed type, set forth in their catalogues the merits and unique advantages of their particular filter patent, it is very often difficult to get reliable information on their disadvantages, and it is a great asset to be able to disprove, either by practical evidence or by logical reasoning that the advantages have the value claimed for them. There are dozens of books dealing with the old slow sand system of filtration, but there are few giving correct information on rapid filters; a long treatise on rapid filters is in preparation, but it will, however, be some time before this article is finished, so that in the meantime the following general remarks may be found of assistance to engineers and others interested in the economical and efficient purification of water, for there is no doubt that the question of rapid filtration of water requires special study and it is a subject that has made immense progress in the last fourteen years. The common notions about films forming on the surface of the filtering material are most misleading. In the case of slow sand beds the idea of such formation is more applicable in explaining what actually takes place and how the filter comes into condition but correctly speaking the only difference between slow sand filtration and rapid filtration is that in slow sand beds the straining action is principally confined to a thin layer of filtering material about ½ in. deep on the surface, whereas with rapid filtration, although the surface layer does the greater part of the work, still the impurities penetrate right down almost to the bottom of the bed so that it is necessary to have depth of bed otherwise the filtering efficiency is extremely poor. When the bed of a filter is ready for cleaning, the impurities are found to have penetrated in a gradually decreasing quantity almost to the bottom. There are features in this respect where certain closed types of mechanical filter have a great advantage.

In all rapid filters which depend principally on the blowing up of the bed by means of concentrating streams of water from nozzles or restricted openings assisted in many cases by air, as in the Jewell, which is of the American open type, or steam in others, it is necessary to have a certain depth of coarse material at the bottom to obtain a good distribution of the cleaning action, the coarse material is generally about 10 in. or 12 in. deep and possesses no straining or filtering action at all, so that this portion of the bed is inefficient as regards filtering. The effective bed must be above this and must not be less than 3 ft. in large filters. In a slow sand bed, owing to the action being almost entirely on the top layer, a bed can be worked down until it is perhaps less than 1 in. thick, without fear of inefficient results. In mechanical filters cleansed by a voluminous reverse flow of water through the bed, the fine portions are always thrown to the surface and this is both theoretically and practically wrong. The surface always chokes first in any filter and, therefore, the material at the surface should not be finer than the rest of the bed, otherwise the length of duration that the filter will work between cleansing periods will be reduced. In the best and most efficient of the closed filter systems the bed is of one uniform grade throughout from top to bottom, so that every inch of depth gives equal filtering efficiency, and the best of these filters are those with which it is unnecessary to have a voluminous reverse flow of water under a high head and in which the method of agitation of every particle of the filtering medium during the cleansing process is simple and sound and is not expensive of maintenance and in which the filtering material is kept well mixed so that any fine portions do not tend to find their way to the surface and in preference the reverse.

(To be continued.)

Kamfersdam.

The report of the Kamfersdam Mines, Ltd., for the year ended 30th June, 1919, states that the mine is still closed down, but the managing director is proceeding to South Africa as soon as he can obtain a passage—it is hoped before the end of this year—and on his arrival will re-start operations as soon as possible.

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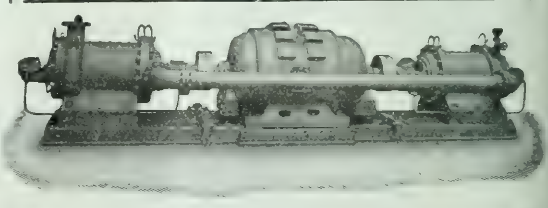

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Over a century of consistent effort and an ever-ready ability to adjust the business mind to changing conditions has placed the firm of Sanderson, Brothers, and Newbould, Ltd., in the commanding position which it occupies amongst Sheffield steel-undertakings to-day. The firm first went by the name of Naylor and Sanderson, having been founded by the late Mr. Thomas Sanderson, who, after a time took into partnership with him Mr. Naylor. It was on the retirement of Mr. Naylor that the concern of Sanderson Bros. & Co. was formed, by Mr. Sanderson accepting as collaborators his brothers John and James. In 1836 occurred the death of the founder, and about 20 years afterwards, John and James were also removed by death. The policy of bringing up the younger generation to carry on the business was closely adhered to, and, on the death of Messrs. John and James Sanderson, the management of the works was taken up by Mr. Henry Furniss and Mr. Edward Hudson (nephews of Mr. Thomas Sanderson), and Mr. Edward, son of Mr. John Sanderson. The last of these gentlemen became identified with the American trade, and resided principally in New York, as the firm's American representative. In this connection it may be mentioned that the sales of the Sanderson Steel in America reached such large proportions that it was decided in 1875 to establish a plant in that country, and accordingly, in the year following the Sanderson Brothers Steel Company was formed under the laws of the State of New York, and in 1900 was absorbed by the Crucible Steel Company of America. The Sheffield Company, who had up to that time been large shareholders in the Syracuse branch, were thus in a position to consider new and important developments of the original concern, and they absorbed entirely the firm of Samuel Newbould & Co., Ltd., with goodwill and trade marks, and a world-wide reputation for the manufacture of steel, saws, machine paper-cutting and agricultural knives, one of the leading concerns of its kind in Europe. Messrs. P. MacGregor and S. B. Halcomb, who had been managing directors of Messrs. Sanderson Bros. & Co., since 1891, continued in the same position with the new company, and instead of following the popular idea of trying to turn out an immense tonnage, and to this end going into the manufacture of low-grade material by the comparatively new Bessemer or open-hearth process, they continued the unvarying policy of the company, confining their operations to the manufacture of crucible cast steel, as the higher grades of tool steel had at all times been the principal output of both companies. The plant of the company is being continually brought up to date in every direction. New and extensive rolling mills of latest design for the rolling of bars and rods have recently been added, as has also a specially equipped heat treating plant for dealing with high tensile steels. During the War, the manufacture of many of the standard products had, perforce, to be eliminated, and the company's record of War products is one of which they are justly proud. These included an immense output of bayonets of every variety, of swords and claymores, lance heads, shells, tank plates, paravane cutters, cavalry saddletrees, and gun parts. Much of the special plant installed for the mass production of these articles has now been reorganised to deal with the rapidly growing demand for the company's standard products. The development of the manufacturing departments, wood and metal saws, files, machine knives, etc., has been particularly marked. Sanderson Brothers & Newbould, Ltd., specialise highly in the production of machine knives of all kinds, but with particular reference to the tobacco and paper trades. In common with most of the older Sheffield firms, they have paid for their success by the necessity of frequent moves, and have, at various times, been located under the name of Naylor & Sanderson, at Wadsley Bridge; Sanderson Brothers & Co., West Street; Samuel Newbould & Co., Bridgefield. About 1830, there was a split in the firm, and a part of the personnel commenced business as Naylor, Hutchinson, Vickers & Co., at Millsands, a development which led to intensive competition, and the publication, in 1832, of a manifesto by Sanderson Bros. & Co., signed by such well-known names as Joseph Rogers & Sons, George and James Butler, and Joseph Elliott, of Sheffield, and many important firms in the United States, testifying to the excellence of the products which they had bought under the name of Naylor & Sanderson, and expressing their confidence in the products and reputation as manufacturers of the Brothers Sanderson trading under the new name. This manifesto forms one of the most interesting documents in the history of the Sheffield steel trade. About 1872 the old works were abandoned, and moved to the Attercliffe Forge, and to Darnall where they still exist. As is well known, Messrs. Sanderson, Bros. & Newbould, Ltd., have for many years been getting considerably more than a fair share of the steel business, both mining and general engineering in this country through their sole agents, Bartle & Co., Ltd., of Loveday House

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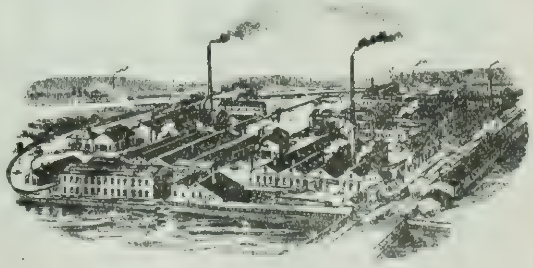

Attercliffe Works, 1920

Company Meetings.

CORONATION SYNDICATE.

Extraordinary Meeting.

An extraordinary general meeting of shareholders in the Coronation Syndicate, Ltd., was held in the board room, Exploration Buildings, on Friday, January 16th, 1920, at 12 noon. Senator the Hon. T. A. White presided. There were also present: Messrs. G. Sonn, A. Mackie Niven, Col. J. Donaldson, F. W. Baxter, J. W. Haley, J. B. Lithgow, A. E. Viney, and (by request) Mr. C. A. Wentzel, solicitor for the company. Representing 1,738 shares; proxies as laid on table, 42,649 shares; total number of shares represented, 44,387. The chairman declared the meeting properly constituted. The notice convening the meeting having been taken as read, the Chairman said :—Gentlemen—This is an extraordinary general meeting of the shareholders of this Syndicate, convened to confirm or otherwise a provisional agreement entered into between the board of this Syndicate, Harry Graumann and others, to acquire 994 claims in the Heidelberg district and the options over three farms, also in that district, and for the necessary increase of the capital of this Syndicate. The notice, which has been extensively advertised, gives particulars of these agreements the oriignals of which are lying on the table. In conjunction with the London Committee of this Syndicate, your board has for some time been on the lookout for a good property to revive the Syndicate, and at last have succeeded in acquiring the 994 claims, as advertised, which in the opinion of several engineers of standing are considered the pick of the basket on the extension of the Far East Rand, and the prospecting of the claims has shown very satisfactory results. A report on these claims by Mr. J. M. Calderwood, M.I.M.M., with a sketch plan, is lying on the table for your inspection and perusal. If you to-day confirm the agreements entered into the vigorous further development of the properties will be immediately taken in hand, and we look forward with confidence to the successful development of the properties. The Chairman then moved the following resolutions :—1. That the provisional agreement between this Syndicate, Harry Graumann (acting for himself and principals), and the London and County Trust, Limited, as contained in the written agreement signed in London on the 14th day of October, 1919, and in the supplementary and amending agreement signed at Johannesburg on the 21st day of November, 1919, and laid before this meeting, be, and the same is hereby ratified, confirmed and adopted, and the directors of this Syndicate are hereby authorised and empowered to carry the same into effect. The foregoing resolution, on being put to the meeting, was carried unanimously. 2. That the capital of the Syndicate be, and the same is increased from £220,000, divided into 220,000 shares of £1 each, to £520,000, divided into 520,000 shares of £1 each, by the creation of 300,000 new shares of £1 each, which 300,000 new shares will be allotted and issued by the Board of Directors of the Syndicate, duly authorised thereto by this resolution, to the said Harry Graumann and/or his nominees, for the consideration, and in terms of the said above-mentioned agreements. The above resolution, on being put to the meeting. was carried unanimously. 3. That the board of directors of the Syndicate be, and it is, hereby authorised and empowered from time to time to further increase the capital of the Syndicate, by amounts not exceeding in the aggregate £200,000, and to allot and issue the new shares resulting from such increase and/or increases of capital to satisfy the options granted under the said agreements, if, and when, the same shall be duly exercised. The above resolution, on being put to the meeting, was carried unanimously. 4. That the board of directors of the Syndicate be, and it is hereby, further authorised and empowered, in addition to, and exclusive of, any of the above-mentioned powers granted to it, to increase the capital of the Syndicate from time to time ,and at any time or times, by amounts or an amount not exceeding in the aggregate £30,000, and to allot, issue, and deal with the new shares resulting from such increase, and/or increases of capital as it may in its entire discretion think fit. The above resolution, on being put to the meeting, was carried unanimously. The Chairman announced this concluded the business before the meeting, and a vote of thanks to the chairman terminated the proceedings.

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A REVIEW.

The Mineral Industry. Vol. XXVII., 1918. Edited by G. A. Roush. McGraw-Hill Book Co., Inc., New York. Price, $10.

Volume XXVII. of this annual review of the mining and smelting field is well up to its predecessors, although the end of the War is still too recent for full information to be available regarding the status of the industry in most foreign countries. Belgium is a notable exception, that sorely-tried country having published, within three months of the German evacuation, a full report of the production of the occupied territory for the period of the War, as well as the conditions the various plants were left in by the retreating Germans. As the editors point out, this example might with great benefit to the industry be followed by some of the more favoured of the belligerent nations; until such reports have been made, much of the material will necessarily need to be treated from the American standpoint. The general scope of this annual résumé of the mining field is too well known to require extended comment here; almost all that is needed is to call attention to its publication. The plan of the preceding volumes has been followed, each branch of the industry being discussed in an individual chapter, alphabetically arranged. As a work of reference it would seem to be indispensable to everyone engaged in the business of mining.

African and European Investment.

The report of the African and European Investment Company for the year ended 30th June last states that since the close of the year the company has purchased the outstanding share interest in the Bechuanaland Farms, Ltd., and is now the sole owner of the 326,595 acres. Very satisfactory progress has been made in the extension of agricultural operations throughout the Transvaal, and the result has been a general increase in the value of farming land throughout the country, and especially of land suitable for ranching. The price at which some of this land has changed hands during the past few months shows a substantial increase over that realised twelve months ago. The export trade in the products of the soil also shows continuous expansion. No sales of land have been effected by the company during the past year. Current prices, however, are now reaching the level at which the directors may consider themselves justified in disposing of certain of the properties, and the question is receiving their attention. Regarding share interests, the market value of the quoted securities (the book cost of which represents about 83 per cent. of the company's holdings) was at 30th June last about £104.000 in excess of their book cost, and since that date a further appreciation has taken place. The capital of the Vereeniging Estates, Ltd., is being increased to £1,000,000, and 243,527 shares are to be offered to shareholders of that company at 25s. per share. This issue has been guaranteed by this company for a commission of 2½ per cent. The proceeds will, in the first place, be applied for the redemption of the £200,000 issued debentures, and the balance will be utilised for the general development of the estates. The East Rand Mining Estates, Ltd., has now started the development of its most important gold farm Grootvlei. The capital of the Grootvlei Company (which owns the gold mining rights on the farm, and in which the East Rand Mining Estates has a large share interest) has been increased to £1,500,000, and 250,000 shares have been subscribed and issued at 21s. per share. This issue was guaranteed by this company for a commission of 1s. per share, in addition to which it receives options over a large number of Grootvlei shares extending over periods of from two to five years. This investment is regarded by the directors as an extremely promising one. The Lonely Reef Gold Mining Company (in which a large share interest is also held through its interest in the Rhodesia Gold Mining and Investment Company) estimated the ore reserves at 30th September last at 191,430 tons, valued at 24·25 dwts., as against 198,585, value 20·64 dwts., at 30th September, 1918. Two interim dividends, representing together 6s. per share, have been paid during the year. The company has also guaranteed the reconstruction of the Sheba Gold Mining Co., Ltd. A new company is being formed with a capital of £300,000 in 5s. shares, and 1,084,954 shares, 4s. paid (with a liability of 1s. per share), will be offered to shareholders in exchange for their present holdings. This company has guaranteed the liability on the new shares for a commission of 5 per cent. The operations for the past year have resulted in a net profit of £44,900, which has been carried to profit and loss account, and has increased the balance standing to the credit of this account to £55,302.

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Notes and News.

Our Special Coal Number.

Our Special Coal Number is now ready and will be found on the bookstalls to-day. Readers will appreciate the vast amount of time and trouble needed to produce this monumental work when they note its size and bulk. The volume runs to upwards of 200 pages; and may fairly claim to be one of the biggest feats in technical journalism attempted in this country. The number is entirely separate from our ordinary weekly issue, and those desirous of possessing a copy should not delay, as it promises quickly to be sold out.

* * * *

African Banking Corporation.

The net profits of the African Banking Corporation continue to increase. From £54,869 in 1916 they went to £79,940 in 1917, thence advancing to £132,007 in 1918, and now to £194,773 for the year to September 30 last. The dividend, which rose from 6½ to 7½ per cent. in 1917 and to 8 per cent. for 1918, now advances to 9 per cent., less income tax. The reserve benefits to the extent of £30,000, as against £40,000 last year and £30,000 the year before, but the carry-forward continues to augment at £37,665, in comparison with £28,740 and £36,013 in the two previous years.

* * * *

Prof. Schwarz to Lecture.

Professor E. H. L. Schwarz, F.R.S., F.R.G.S., of Rhodes University College, Grahamstown, will deliver a lecture in Johannesburg on Friday, the 6th February, in the University College Lecture Hall. The subject is one which should interest every person in South Africa, viz., The Kalahari. It will be remembered that Prof. Schwarz some time ago contributed to our columns a valuable series of articles on the subject, and he has since been lecturing on it at Capetown, Port Elizabeth, and other Cape centres. He is certain to command a large and appreciative audience on the Rand.

* * * *

S.W. Diamond Output.

In South-West Africa the diamond output for the year ended 31st March, 1919, was valued at £860,000, compared with £833,953 for the year 1917, and £749,000 for the calendar year 1918. Approximately 7,500 tons of copper ore were exported to complete contracts, after which export was stopped. The quantity of ore available for export at the end of March was approximately 150,000 tons. Five tin mines are working, two of which re-opened in October, 1918. Seventy-four tons of tin were exported during 1918. The output of marble from the Karibib quarry was 73 tons. Three hundred and seven tons of salt were railed from Rossing and Swakopmund.

* * * *

The Price of Silver.

The extraordinary rise in the price of silver continues to excite comment. In 1915 the average price (ignoring fractions) of silver per ounce was 23d., in 1916 it went to 31d., in 1917 to 40d., and in 1918 to 47. Now it has gone up further, and the price is likely to rise higher still. Trouble in Mexico is said to be the cause, for silver comes from Mexico and the States—90 per cent. of the world's supply, and no other supplies really count. A five-shilling piece and a sixpence newly minted weigh 1 oz., so that it can be seen how close the commercial price of silver is to the face value of coins. We are told that to-day, and for some time past, English firms have been "boiling down" French five-franc pieces, thousands of them having passed through their hands, and the position in regard to Italian and German coins has been much worse. Although it is illegal to reduce gold to bullion, the silver currency of foreign countries may be turned into bullion. In coins of the Latin countries the recognised proportions of alloy are 10 per cent. copper to 90 per cent. silver for the larger currency, while the proportion of silver for the smaller exchanges is 83.5.

The Union's Mineral Harvest in 1919.

The value of the mineral output of the Union of South Africa for last year was £50,841,405. Details of production, as returned by the Government Department of Mines, are as under: Gold, 8,331,651·142 fine ozs., value £35,390,609; silver, 891,303·635 fine ozs., value £203,646; diamonds, 2,592,098·60 carats, value £11,237,778; coal, 10,261,859 tons, value £3,430,361; copper, 4,904·879 tons, value £208,902; tin, 1,628·554 tons, value £275,111; other base metals, value £94,998. These figures do not take into account the premium on gold. If this additional figure be taken into consideration the total value would work out at just about halfway between fifty and sixty millions sterling.

* * * *

The Diamond Market.

According to the latest London advices, conditions in the diamond trade have opened the New Year most encouragingly. Already the demand for both rough goods and brilliants exceeds that experienced during the War, or before the War—in fact, the inquiry is greater than at any previous period in the history of the trade. As an indication of how things have developed we may mention that merchants who at one time regarded themselves as dealing in a big line if they placed an order amounting to £15,000, now come forward almost unconcernedly for goods to the value of between £200,000 and £300,000 at a time. No hint is given as to a change in price, but with the expanding demand competition is likely to be exceedingly keen. It is said that certain merchants who were buyers of diamonds before the War, and who during that time were out of the market, are now putting in an appearance again.

* * * *

Rand Mines in New York.

The Central Mining and Investment Corporation, Ltd., with the consent of Rand Mines, Ltd., have made arrangements with Messrs. Bernhard, Scholle & Co. for the introduction into the New York market of shares of Rand Mines, Ltd., in the form of American certificates issued as to one American certificate against the deposit of 2½ Rand Mines shares. Application for listing these shares on the New York Stock Exchange will be made in due course. In London it is thought that once the pre-War prejudice of the average American against investing money in enterprises outside his own continent is finally broken down the way will obviously be clear for multifarious new activities. While the abnormal state of the currency exchange persists there is, of course, an extra inducement for the American investor to buy English, French and other shares, since any substantial and sustained recovery in the depressed European exchanges would automatically—*ceteris paribus*—make his purchases of greater realisable value in the shape of dollars. Whereas he can buy £100 worth of scrip now for $380, he might ultimately be able to resell for, say, $480 simply as a result of a rally in the exchange.

* * * *

The December Mineral Output.

The usual monthly returns issued by the Mines Department of the Transvaal are now available. The following are the principal items to be noted in connection with the statistics for the month of December:—Labour: Gold mining, whites 23,767, coloured 175,043, total 198,810; diamond mining, whites 4,495, coloured 24,559, total 29,054; diamond alluvial, estate and river digging, whites 7,506, coloured 18,781, total 26,287; coal mining, whites 1,753, coloured 31,589, total 33,342; copper mining, whites 203, coloured 2,067, total 2,270; tin mining, whites 219, coloured 2,186, total 2,405; other base mineral mining, whites 119, coloured 2,223, total 2,342; grand totals, whites 38,062, coloured 256,448, total, 294,510. Output: Gold, Witwatersrand, 626,981·739 fine ozs., value £2,663,249; other districts (Transvaal), 18,015·977 fine ozs., value £76,526; other Provinces, 86·777 fine ozs., value £369; total, 645,084·493 fine ozs., value £2,740,144; silver, 65,699·380 fine ozs., value £19,711; diamonds, 237,381·16 carats, value £1,284,588; coal (sales), 852,488·000 tons, value £291,522; copper ore and concentrates (sales and shipments), 103·270 tons, value £7,859; tin concentrates and metallic (sales and shipments) 142·165 tons, value £29,119; other base minerals (sales and shipments), value £9,481; total value, £4,382,424.

* * * *

A New Lace Diamond Flotation.

The Postmas Diamond Prospect, Ltd., has been incorporated in the O.F.S. and registered at Bloemfontein on the 22nd November, 1919, to acquire certain option of purchase over the farm Bishop, district of Kuruman; and certain prospecting areas pegged under licences on the Postmasburg Commonage (Crown lands), Cape Province. The nominal capital of the company is £50,000 in 50,000 shares of £1 each. 35,000 shares have been issued to the vendors in full settlement of all their rights and interests acquired under the vendors' agreement, and 7,500 shares have been subscribed for at par by the promoter. The remaining 7,500 shares of £1 each are held in reserve and are under option to the promoter at par for two years from date of registration of company. The chairman of the company is Mr. J. Dale Lace, and the other members of the board are Messrs A. Langebrink and L. Edwards. The company's auditor is Mr. J. S. Richardson, of Stock Exchange Buildings, Johannesburg, and the secretary is Mr. T. L. Day. The office of the company is situated at Lace Building, 74 Fox Street, Johannesburg. Subsequently to its formation the company has acquired further prospecting areas (Crown lands) on the Postmasburg Commonage, and now holds in all 25 such areas, on which two diamond mines of considerable area have been discovered. The first was discovered on the 14th November, 1919, and the second on the 24th December, 1919. Operations are now being carried on at both mines as well as the other areas and have disclosed the presence of diamonds of excellent quality.

* * * *

The Position at the Shamva,

The report to December 31, 1918, states that during the year under review development and prospecting operations opened up new areas, disclosing a large tonnage of payable ore, which increases the ore reserves as at December 31, 1917, by 971,200 tons. Since the date of the consulting engineer's report (March 19, 1919), prospecting has been done on Cymric Hill, so far with encouraging results. This hill lies 3,000 feet north of the Shamva main body, and the tonnage herefrom in prospect, together with the quantity of excess ore, which it has been found possible to put through the mill during the year, is expected to considerably extend the life of the mine. At December 31, 1917, the estimated ore reserves stood at 1,608,351 tons, of an average estimated value of 4.43 dwt., to which were added up to December 31, 1918, 971,200 tons, of an average estimate value of 3.8 dwt. Deducting the tonnage crushed during the year—namely, 556,881 tons, of an average value of 3.6 dwt.—the estimated ore reserves at December 31, 1918, are shown to have been 2,023,000 tons, of an average estimated value of 4.3 dwt. Owing to the influenza epidemic and the serious shortage of coal from time to time, the mill ran only 292.571 days, crushing 556,891 tons, of an average feed value of 3.63 dwt., giving a total net recovery value of £383,843—the profit realised, including sundry revenue, but deducting London expenses, being £111,844. Of this amount £5,600 was placed to reserve, leaving a not profit of £106,244. The increased cost of mining material, stores, war bonuses to white employees, and requisites due to the War, enhanced the aggregate working costs by 8·21d. per ton, the total being 118·13d. per ton for 1918, against 109.92d. per ton for 1917. The company joined in an agreement, which has been entered into with the Bank of England, under which its gold will be sold in the best market. Three quarterly dividends, equal to 15 per cent., were paid during the year, and a fourth quarterly dividend, in respect of the quarter ended December 31, 1918, was declared on January 22, 1919, and paid on February 27. In respect of the current year three quarterly dividends, equal to 15 per cent., have been paid for the nine months ended September 30, 1919.

TOPICS OF THE WEEK.

GOLD AS A COMMODITY.

The controversy in regard to the gold question goes gaily on in the daily papers, and meanwhile the first fruits of the free market for gold are seen in tangible form in the quarterly reports of the Barnato Group, issued this week. These show that in the three months ended December 31 last, the Randfontein Central worked at a loss of £7,037, which was changed into a net profit of £174,077 by the profit in respect of the gold premium! This premium on production from July 25 last (when the new arrangement for the free disposal of gold came into force) to December 31 is based on an estimate of 19 per cent. Again, the Government Areas profit of £246,226 for the quarter was swelled to £452,266 by the additional profit from the gold premium. In the case of the Langlaagte Estate the profit for the quarter was £5,945 and the gold premium added £48,840. The Van Ryn Deep made a profit of £172,645 and the premium added £110,972. The Consolidated Langlaagte declared a profit for the quarter of £23,533, to which the premium added £54,952, and so on. These figures prove that the low-grade mines of the Rand have been saved by the free market for their product. Some very interesting tables were recently published by one of the big firms of stockbrokers with a view to showing what difference the gold premium would have made had it been in operation during the whole year. They take the result of last year's working, with gold at 85s. per fine ounce, and compare the profits as they would have been with gold at £5 and five guineas per ounce, showing also what every shilling rise in the price of gold means to the different producers. The working profit is reckoned with gold at 85s. per fine ounce. The year in each case ends in December:

Company.	Working profit.	With gold at 5 guineas.	Every 1/- rise.
City Deep	£447,000	£780,000	£15,300
Crown Mines	410,600	1,066,000	30,300
Government Areas ...	876,000	1,382,000	25,400
Jupiter	3,200	84,300	3,780
Knight Central	15,600	107,000	4,184
Modder Deep	593,800	837,000	12,183
Springs	423,700	648,000	10,700
West Rand	7,548 loss	96,000	4,828

These are a few of the most striking examples, and give some idea of the difference in profits which ought to be reflected in the next dividend declarations. Gold has now become a commodity in Great Britain, and the hitherto accepted axiom that excess of gold means high, and the reverse low, prices, no longer applies, as commodities are valued in relation to the redundant currency notes, and not in relation to gold. The subject, which is of such vital importance to the Rand, is dealt with at length by Messrs. Samuel Montagu & Co. in their yearly review of the bullion market, which was issued recently. Currency systems (they remark) are now so fettered by Government restrictions that the existence and magnitude of gold stocks have lost the special significance they once possessed. While in one country large accumulations may mean that export of gold is forbidden, in another they may imply that gold has had to be accepted in default of more profitable remittances. To wage and win the War the Government naturally did not hesitate to pledge the resources of the United Kingdom, the prestige of the British Empire and the future labour of the British people. In this way the United Kingdom contracted on a gold basis an enormous foreign debt on behalf of the Allied cause, the immediate liquidation of which in goods or gold is impracticable owing to the production of these commodities being limited by time. Adverse exchanges have therefore come into existence with regard to Britain's creditor nations with higher prices for imported goods than would otherwise have been the case. During the War the output of gold within the British Empire was commandeered by the Bank of England on the British currency basis of 77s. 9d. per standard ounce, and was applied in the direction best suited to further the Allied interests, but in response to pressing representations from the mining industry in the Transvaal and elsewhere on the score that the rise in prices and wages had added heavily to the cost of production, this restriction was removed, and, though the gold continued to be imported into the United Kingdom, it was allowed to be sold to the best bidder and to be re-exported where desired subject to a Government licence. The average daily quotation since 12th September was 101s. 11¼d. Gold at once commanded a price of about 15 per cent. above the normal (77s. 9d. the standard ounce), its enhanced value for export to India, the United States, Spain, etc. At the same time the market quotation was altered from the standard to the fine ounce. The value of gold for industrial purposes during the War in the United Kingdom and other countries reached much higher prices, even £6 per fine ounce and more was paid. Naturally a premium corresponding to the external demand is still maintained within Great Britain. Messrs. Montagu estimate the British Empire's stocks of gold at £222,614,000, against £890,930,000 held by the United States Treasury and the Federal Reserve banks. Other large holders are France £223,117,000, Spain £96,895,000 and Japan (including silver) £81,648,000. In respect of production it is noteworthy that while the world's output is decreasing the proportion of the British Empire is steadily on the up grade. It is thought probable that the world's production, notwithstanding the enhanced price of the metal, will show a further considerable decrease in the current year. The question we are all asking is thus answered by Messrs. Montagu: "Relaxation," they say, "of the enormous demand for remittances in precious metal—whether silver or gold—can only come when industry, disorganised by the War, regains its elasticity and commodities can be produced and exported in sufficient quantities to reduce appreciably the external debt with which the late combatant nations are so heavily handicapped." In well-informed circles it is considered that at least two years must elapse before the exchanges return to normal. Let us hope that the premium on gold, which has so providentially saved the Rand, will be maintained during that period.

Union Oil.

Speaking at the annual meeting of the Union Oil Company of South Africa, Ltd., in London lately, the chairman, Mr. Macalister, said: They would remember that there was trouble with their expert, Dr. Blair, and litigation had commenced on both sides, but Dr. Blair had died, the litigation had been settled, and he had obtained Dr. Blair's report for £250. That report was an extremely long and favourable one, and was accompanied by voluminous plans. What Dr. Blair said was this: "In view of the comparatively small amount of money that has been expended in proving the foregoing area, one cannot but regard the result as satisfactory, and bearing in mind the fact that this area represents a little under 2¼ per cent. of the total area of the farms Spuitfontein, Winterplaats, and Roodekraal, it will be at once seen that the possibilities of other workable seams of oil shale which have been discovered are quite promising, and, as an instance of such probability, I may cite the fact that I opened up one cutting on the seam of shale on Spuitfontein with an extremely satisfactory result. The 2 ft. section of high-class shale yielded 43·7 gallons of oil per metric ton, and the 5 ft. section yielded 20 gallons per metric ton. I have roughly computed the area through which this seam of shale is likely to extend. In fact, it outcrops at three other places, as indicated on the map, and I find it to be about 1,420 acres. Assuming this specific gravity to be true, this would give a quantity of 6,901,200 tons of 43·7 gallons per metric ton and 17,253,000 tons, value 20 gallons per metric ton, so that when one considers the number of other seams which have been disclosed and not yet fully investigated, I can only view the possibilities of the properties as being extremely promising, so far as the probable available quantity of workable oil shale is concerned."

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THE RAND'S LABOUR SUPPLY.

How it Might be Improved and Augmented—Views of an Authority—Establishment of Black Schools of Mines Advocated—The Outlook for Recruiting—The Government and the Northern Latitudes Question—Why not Labour from "German East?"—A Vast Untapped Labour Reservoir.

In continuation of the article appearing in our last issue on the subject of native labour shortage on the Witwatersrand, the prospects of securing better efficiency amongst the "boys" recruited and the necessity for opening up fresh recruiting areas, we give this week some further facts and figures in regard to these subjects which are of vital—one may truly say paramount—importance to the mining industry.

Training Schools for Native Miners.

It may be recalled that last week we advocated the establishment of mine training schools for natives in centres from which large supplies of native labour for the mines are derived. Since our last issue appeared we have sought the opinions on this subject of prominent mining men and those who are intimately associated with the recruiting and organisation of native labour for the mines. They are all agreed that the scheme is a good one and is at least worthy of an experiment.

Authoritative Views.

A prominent official of the mining industry, who has had life-long experience of native administration, when approached on the subject, remarked: "A few months ago a conference of officials concerned with native educational matters was held at Umtata. I was unable to attend this conference, but I wrote a letter in which I advocated that the A.B.C. of mining should enter into the curriculum of native schools. I certainly think your suggestion is a good one and I feel it should be taken up by the educational authorities in co-operation with the Department of Native Affairs. There is a general disposition amongst the educated natives to regard mining as undignified and unremunerative work. Scores of able natives drift up here and scorn any kind of job beneath the dignity of that of a coloured clerk. These people could be of great service to the mining industry if they were given some training in the rudimentary principles of practical mine work and they would find it advantageous to themselves to have this knowledge."

The Recruiting Outlook.

"What is the outlook for obtaining an early increase in the native labour supply?" we questioned.

"I am afraid it is not too promising," answered our informant. "If the Government decides on the experiment of obtaining a batch of natives from north of Latitude 22 it is only to be expected that they will require a long period of time to elapse before any definite and official conclusion is arrived at in regard to the value of Dr. Sir F. S. Lister's inoculation methods. A year would probably elapse before authority for recruiting on a large scale was sanctioned. As to the outlook for augmenting the labour supply of the mines from British South Africa the prospects are not good. It is true that on account of the famine in the Native Territories a considerable number of 'new boys' are coming to the Rand for work. But most of them are old men and mere youths and there is a very high percentage of rejects."

"You agree then that we must look to northern latitudes for any substantial augmentation of our native labour supply?" we asked.

"Unquestionably. There are large areas in the interior which have a climate not very dissimilar to that of the Witwatersrand and which contain huge and well nigh untapped labour resources. It is to these areas that the mining industry must look for salvation and for this reason it is to be hoped that the Government will sanction the employment of natives in certain districts situated north of the twenty-second parallel of latitude."

A Huge Reservoir of Labour.

These latter remarks we are able to supplement from our own experience of Central East Africa. We have in mind particularly the territory hitherto known as German East Africa and the districts contiguous to that area around its southern borders. The conquered colony has a black population of between seven and eight millions, and a study of a map of the territory, which portrays altitudes and density and types of population, exhibits the fact that the hardiest tribes tend to congregate on the high plateaux of the interior. The mean altitude of a considerable belt of country extending from the north end of Lake Nyasa almost up to the central railway is as great as that of the Rand, and the climate is not disimilar to that of the High Veld. There are similar areas in the portion lying north of the Dar-es-Salaam-Tanganyika railway. These districts supplied hundreds of thousands of porters during the recent military operations and the amount of pay earned by them from the British has created a certain amount of wealth with its concomitant desire for further employment as a means to greater possessions. Yet, so far, this huge reservoir of strong, hardy and efficient labour has scarcely been touched. Just before the outbreak of War the following Government return was made of natives in European employment:—

Railway construction and repair ...	16,055
Railway service	4,007
Harbour works, Tanga	100
Government service	5,000
Employed by European merchants, etc.	2,500
Employed in caravans for Europeans ...	5,000
At mission stations	3,000
In European domestic service	9,000
Mining	2,966
Plantations	91,892
Total	139,520

In addition, some 25,000 were in the employ of Arabs and Indians. Wages ranged from 3 to 12 rupees per month in addition to food. Natives employed on the Central Railway received from 8 to 10 rupees and a food allowance of 15 hellers (2½d.) a day. It will be seen that only a small tithe of the aboriginal population was brought into the economic scheme under German rule. Here then is an immense field for the recruitment of native labour against the utilisation of which nothing can be really urged. We suggest to the Chamber of Mines and to the Government that the possibilities of augmenting South Africa's labour supply from the new British possession should be seriously considered without reference to any sentimental balderdash about making the Union a white man's country—which is a thing that it can never truly be.

MINE DEPT. EXAMS:—RECENT RESULTS.

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COAL DUST AND SILICOTICS.

Dr. Mavrogordato Investigating—A Simple Explanation of the Matter—Some Suggested Experiments.

Dr. Mavrogordato, who is visiting this country in connection with the absorbing problem of coal dust in relation to silicosis, is actively engaged on his researches, and although it is, of course, too early yet awhile to form any conclusions as to the final results of his investigations the subject is certainly of sufficient interest and importance to merit further consideration.

The Beginnings of the Notion.

It is hardly necessary to state that the whole subject is well outside the scope of ordinary mining engineering, but its importance to all who are engaged in or are interested in mining cannot be exaggerated in a field where miners' phthisis has exacted such a heavy toll in precious lives and where phthisis legislation has imposed a tremendous burden of cost on the industry. Anything calculated to minimise the incidence of the disease or the suffering of silicotics is, it need hardly be said, always welcomed by the mining industry, and Dr. Mavrogordato's presence in our midst is but an earnest of the genuine determination of the controllers of the mines to leave no stone unturned in an endeavour to eliminate this fell factor of silicosis from our industrial and social life.

This journal takes to itself the credit for first directing attention to the investigations of Dr. J. S. Haldane, assisted by Dr. Mavrogordato, into the subject of minimising phthisis through the medium of coal dust. The Chemical, Metallurgical and Mining Society of South Africa interested itself in the matter and an important paper on the subject was read before that association, whilst a very interesting debate resulted therefrom. Dr. Mavrogordato was subsequently engaged by the Chamber of Mines to go into the matter on the spot and in detail.

Facts and Theories.

The results of his investigations will be awaited with the keenest interest particularly by the men on the mines. Not only amongst the workers but amongst numerous mine officials as well, an idea seems to prevail that either some little understood chemical reaction or else a replacement of molecules results when the coal dust comes into contact with the silica in the lungs of sufferers from phthisis. So far as we can gather, the beneficial effect of coal dust to a silicotic is simply this, that inhalation of coal dust (whether a man be phthisical or no) sets up a certain irritation and unpleasant taste which causes expectoration, and if silica is present in a man's lungs there will be a tendency to spit out the silica as well as the coal dust, provided that the lungs have not been cemented. In other words, it would seem that the inhalation of coal dust would be beneficial if a silicotic gold mine worker who was not in the acute stages of the disease were able to change his venue of employment to a coal mine.

The Natives.

These remarks apply, of course, with equal force to natives, and the possibility of temporarily transferring native labour from gold mines to collieries and also of creating coal dust in old worked out galleries and taking natives into these galleries before going on shift has, we understand, been contemplated. Such a scheme would, of course, have to be considered in regard to any possible resultant disorganisation of the native labour force and also in regard to the attitude of the natives themselves towards such an experiment. The best conditions for the admixture of coal dust with silica would obtain in areas where gold mining is carried on in close proximity to coal mining. In this respect ideal circumstances would obtain at, for instance, the East Rand Mining Estates if and when development of the auriferous conglomerates is carried out beneath the carboniferous measures which will be worked in the Largo Colliery. We repeat that it is as yet too early to make any hard and fast predictions as to the line of advocacy which may be adopted by a medical expert on this subject. But it is clear that the inhalation of coal dust can have beneficial influence on early silicotics although not through the media of complex reactions and erudite laws of molecular displacement.

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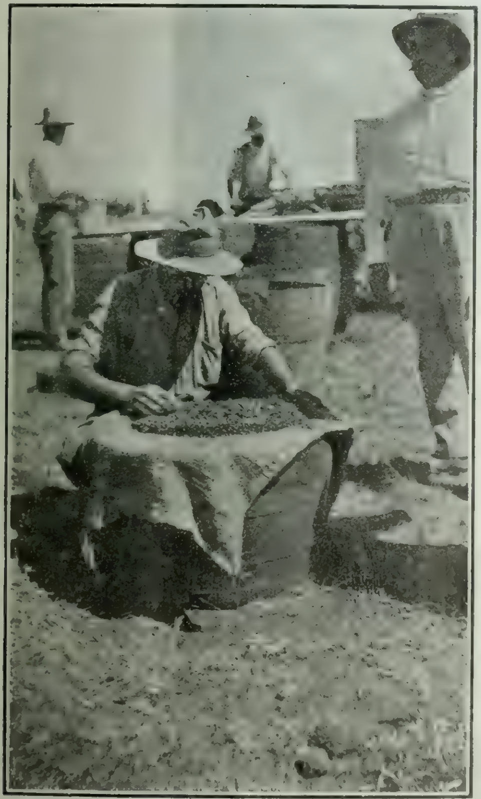
NEWS FROM THE DIAMOND FIELDS.

General Activity and High Prices—A Good Outlook at the Crown Mine—Diggers and their Findings—An Impression of the Alluvial Fields—The "Deep Water" Accident—Resuscitated Ventures.

THE market for diamonds continues to be very brisk in Europe and America, and the prices obtained for good class stuff are simply amazing when contrasted with the prices of a few years ago.

* * * *

The South African producers are reaping a rich harvest in consequence of this demand, and although no exact figures are available the profits now being earned by companies and individual diggers can safely be said to be colossal. The tremendous advance in the price of stones has transformed nany propositions from the stigma of "unpayable ventures" nto the category of highly profitable undertakings. Take 'rown Diamonds for example. This company is now earning teady profits. The last published returns (those for the nonth of December) indicated a profit in the neighbourhood f fifteen shillings per load and as the capital of this company s only £220,000 and the plant is capable of washing not less han 1,000 loads per day, it is obvious that the Crown Mine, otwithstanding its unenviable reputation, is a very profitble undertaking to-day. The stones secured are of first-rate uality and amongst recent finds a beautiful 16 carat stone nas been recovered. The policy of the management is to ncrease the scope of operations and it is expected that the eturn for the current month will be a very satisfactory one.



ON THE ALLUVIAL FIELDS—SORTING, AN EXCITING MOMENT FOR THE DIGGER.

The increased value of diamonds has also greatly benefited individual diggers. Recent returns from the Transvaal South-Western and Pretoria alluvial fields show that the average recoveries of diggers registering finds have been in the neighbourhood of £120 per month, whilst in the Barkly West district of the Cape Colony 1,978 claimholders registered 4,003 carats valued at £78,866 in the month of November.

* * * *

Alluvial diamond digging is a speculative undertaking, but the present high price of stones greatly improves the diggers' chances and much interest attaches to the experiment of sending parties of returned soldiers to the alluvial fields.

* * * *

All over a goodly portion of the South-Western Transvaal one may to-day observe piles of gravel, discarded "cradles," pits and trenches all bearing testimony to the activity of the digger. The year 1919 has witnessed a very marked expansion of operations along the Vaal River as a result of the high prices obtaining for stones and the discovery of two or three very rich rushes. Hundreds and hundreds of people—thousands in fact—of all kinds and conditions of men have been attracted to this area, and the river diggings have drawn away from Commissioner Street those who have paced a weary march throughout months of poverty and bad luck. New discoveries have, too, been the

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Mecca of the old diggers and the objective of many a "bywoner" family. A good few have found it a happy hunting ground; and the great majority have discovered there a means to a hard-earned and hard-found living. Veritable cities of tin and canvas have sprung up like ugly mushrooms on the dry sun-scorched river banks. Piles of gravel, pans and sieves, tubs and sorting tables, "babies" and "cradles," galvanised iron shanties, bell tents and rotted marquees are common features of the landscape. And here are men in places as thick as ants all a-fire with the fever of the gem stone, some well clad (they are the "new chums") the majority in robes all tattered and dirty. Dust storms blow red earth through the lines—lines of hovels, but the digger works on undisturbed and serenely reconciled. Now and then the scraper turns over a brilliant glittering gem, and the digger's face takes on an expression of joy and satisfaction. Sometimes hopes are quickly shattered, for many a new digger has found that what he thought was a miniature "Cullinan" is nothing more than a quartz crystal. But the digger slaves on with "Hope" as his motto. Of the three graces, Hope is surely the most vital on the diamond diggings. Faith is there too, but it does not exist in the breasts of all. Of Charity, the passing stranger sees but little, though it would seem that there is as much need of Her as there is of the other two.

* * * *

The Deep Water Diamonds people have had a stroke of bad luck. Owing to the breakage of the overhead gear, which occurred whilst moving from one spot to another, the plant is now partly submerged in shallow water. The company's engineer reports that this is likely to cause some weeks delay, and operations can only be resumed after the plant has again been put into efficient working order. A thorough investigation is being made as to the cause of the accident, and further particulars will be published in due course.

THE OPEN WORKING OF THE CROWN DIAMOND MINE

* * * *

Numerous ventures are being resuscitated in various parts of the country. The old Driekopjes Mine is, we learn, being reopened, and at the Roberts Victor Mine the washing of tailings has just been commenced.

The Mineral Resources of the Empire.

The Mineral Resources Committee of the Imperial Institute, of which Viscount Harcourt has succeeded the late Viscount Rhondda as Chairman, has arranged for the issue of a series of monographs on the mineral resources of the Empire, of which one on zinc ores has already appeared. Others on manganese ores and tin ores are now published by Mr. John Murray. The monograph on manganese ores has been prepared under the direction of the Committee by A. H. Curtis, B.A., F.G.S., and that on tin ores by G. M. Davies, M.Sc. (Lond.), F.G.S., of the staff of the Imperial Institute. In each case the book is arranged in three chapters. The first gives a brief survey of the occurrences of the ores and of the characters and uses of the metals. The second chapter deals fully with the sources of supply within the Empire, and the third describes shortly the deposits in foreign countries. The monographs conclude with a bibliography of the principal publications on the subjects dealt with. The monographs are published at 3s. 6d. net. Owing to its extensive employment in the manufacture of iron and steel, manganese was in great demand during the War. Unfortunately there was a serious shortage of manganese ores, as supplies from the Caucasus, the chief producer, were cut off, and shipping difficulties restricted the amount available from India, which ranked second only to Russia as a producer of manganese ores. At the present time the output from India is increasing and Brazil has enormously enlarged its production, but in view of the disturbed conditions still prevailing in Russia, there is likely to be a continued shortage of the ore there for some time to come, particularly of the higher grades now required by metallurgists and in chemical industries. Several additional sources are indicated as possible contributors to the world's supply in the future. The Empire is favourably situated as regards supplies of tin ore, and at the present time between 50 and 60 per cent. of the world's output is obtained from British countries. Moreover, it holds a controlling influence in the industry of tin smelting and refining. The Federated Malay States is the most important tin-producing area in the world and most of its output, together with ore from Siam, the Dutch East Indies, South Africa and other countries, is smelted in the Straits Settlements. Bolivia and the Dutch East Indies are the chief foreign producers of tin ore. Owing to the War the German tin-smelting industry has practically ceased, and another result of the War has been the establishment of a tin-smelting industry in the United States, which country consumes 40 per cent. or more of the world's output of tin. Among British sources of supply of tin in the future Nigeria is specially referred to.

THE POSITION OF THE MODDER B.

Grade and Profits Examined—The Coy.'s Large Area—The Unexploited South-Western Section—Will Another New Shaft be Required?

In rather less than three weeks of the current month the market valuation of the Modderfontein B Gold Mines declined by £700,000, and this large depreciation for a stock of such established value as the Modder B has caused considerable attention to be directed to the position and prospects of this property. Fears of labour trouble have, of course, recently affected all the best and high-priced Far East Rand gold stocks, and we should be the last journal on earth to assert that fluctuating stock quotations afford a fair criterion of the fortunes or intrinsic worth of a gold mine. But the heavy liquidation of Modder B shares in the face of a steadily rising premium for gold seems to call for some explanation.

Recent Returns.

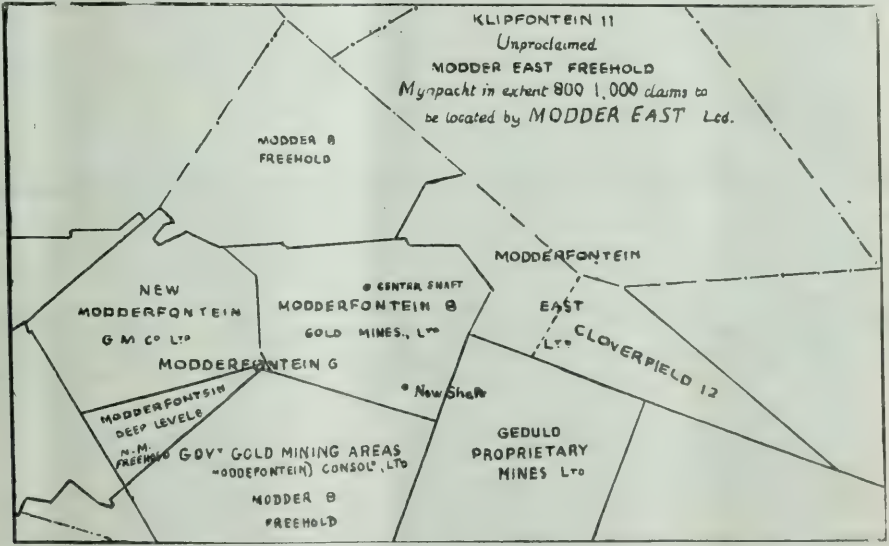
We are not in a position to supply such an explanation, but it will at least be of interest to examine the company's recent returns. The last issued monthly return shows that in December the company milled 51,000 tons for a recovery of 24,104 fine ozs. and, with working costs at 25s. 7d. per ton, earned a profit of £38,719. In common with all other companies, the working costs were increased by holidays on Dingaan's Day and Christmas Day, during which white and native employees received usual wages; also by provision for two months' additional allowances recommended by the Chamber of Mines in respect of increased cost of living. In the preceding month the working costs of this company were 24s. 10d. Taking everything into consideration a rise of 9d. per ton in working expenses is, to say the least of it, not alarming. A less satisfactory feature is the decline in grade. According to the figures published by the Central Mining and Investment Corporation for the month of December the yield per ton works out at 9·44 dwts. This compares with 10·8 dwts. for the month of November when a profit of £52,028 was earned and with 9·89 dwts. for October when revenue exceeded expenditure by £59,953. For five months previous to October returns were:

1919.	Tons.	Revenue.			Cost.		Profit.		
			Per ton.		Per ton			Per ton.	
		£	s.	d.	s.	d.	£	s.	d.
May	55,000	120,487	43	10	20	11	62,001	22	7
June	54,500	121,239	44	6	20	11	63,160	23	2
July	57,000	123,846	43	3	21	8	62,016	21	9
Aug.	53,500	114,714	42	11	22	7	51,020	20	2
Sept.	55,500	117,127	42	2	22	3	54,003	19	6

The quarterly report for the three months, starting with October last, stated: Compared with the preceding quarter, the tonnage milled increased 2,500 tons, the yield was 1s. 7d. lower, working costs 8d. per ton milled higher, and the total working profit £16,184 less. It would appear from these figures that the recent tendency at the Modderfontein B has been for the grade to decline and for working costs to rise with a consequent detrimental effect on profits. As against this must be set the beneficial influence of the gold premium.

The Lay-out of the Mine.

It would seem from an examination of the plan of the mine that funds may have to be provided for the opening up of the south-western section of this property by means of a further new shaft. The Modder B property has dimensions approximating to 2·4 miles from west to east along the strike of the reef and 1·7 miles from north to south, that is to say, on the dip. From the central shaft long main haulages have been driven with subsidiary incline haulages extending towards the eastern and south-western sections of the area. But it has for a long time past been clear that the southern section of the property would require at least one new main point of attack. In the early part of last year arrangements were concluded for the sinking of a new circular shaft which is situated about 4,000 feet south of the central shaft as indicated on the plan attached to this article. This shaft at which sinking is now proceeding is about 4,000 feet north-west of the extreme south-eastern corner beacon of the company's claim area and 1,100 feet north of this beacon a heading has been driven into the Modder B from the Geduld property. Of this driving the quarterly report for the three months ending September stated: The heading from the Geduld Proprietary Mines advanced a further 270 feet, disclosing a lower grade of ore, *viz.*, 291 inch-dwts. This heading is now in dyke; its total advance to date being 915 feet, with an average of 38 inches of reef, assaying 17·7 dwts. or 672 inch-dwts." This is an encouraging average but, judging from the situation of the Modderfontein B in relation to its high-grade western neighbours—New Modderfontein and Modder Deep Levels, and taking into account the size of the unexploited south-western section of the mine, it appears that the sinking of a second new deep level shaft to serve the south-western area would substantially improve this company's underground position and profit-earning prospects.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Plan of a portion of the Far East Rand showing the property of the Modderfontein B Gold Mines, Ltd., and the relative situations of the "New" and "Central" shafts. The development of the south-western section of this property by means of a further new deep level shaft is briefly discussed in the accompanying article.

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THE ZAMBESI MINERAL CONCESSION.

A Mining Area Nearly as Large as England—The Coal Seams and Their Prospects—Two Interesting Photographs—Recent Analyses Satisfactory—A New Factor in our Coal Trade—New Railway Communications Awaited.

The photographs accompanying this article depict coal seams on the Zambesi in the concession of the Zambesia Mining Development, Ltd. These photos show only weathered outcrop, but the analysis of the coal below these outcrops reveals coal of very good calorific value, and it is evident that in the near future the deposits in the Zambesi Valley will become a factor of considerable importance in the South African coal trade.

In the Special Coal Number of the *South African Mining and Engineering Journal* now on sale, reference is made to these coal areas. The excellent photographs here reproduced arrived too late for inclusion in the Special Coal Number, but are now published in this ordinary issue of the *S.A.M. & E.J.* with a certain amount of supplementary data relative to the seams.

A Coal Seam in the Zambesi Valley

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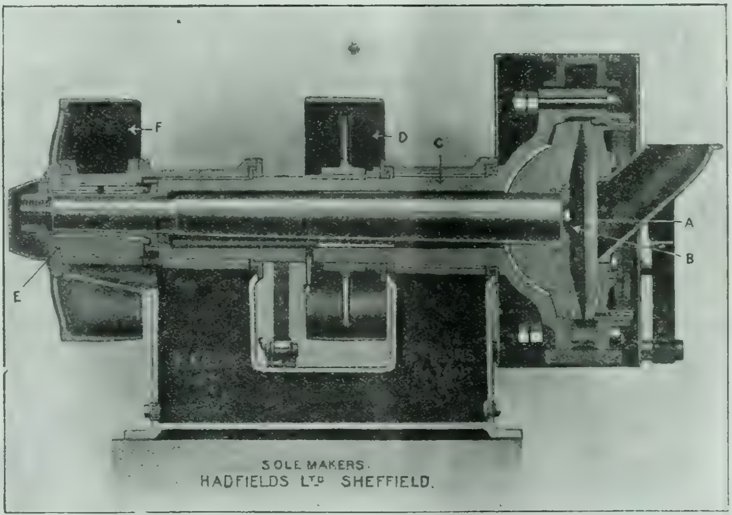

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Recent Investigations.

We learn that the Zambesi Mining Development Company has an extensive and forward policy of development in hand in regard to this coalfield, which will be in a favoured geographical position in regard to trade with the East when the new projected lines of communication are completed.

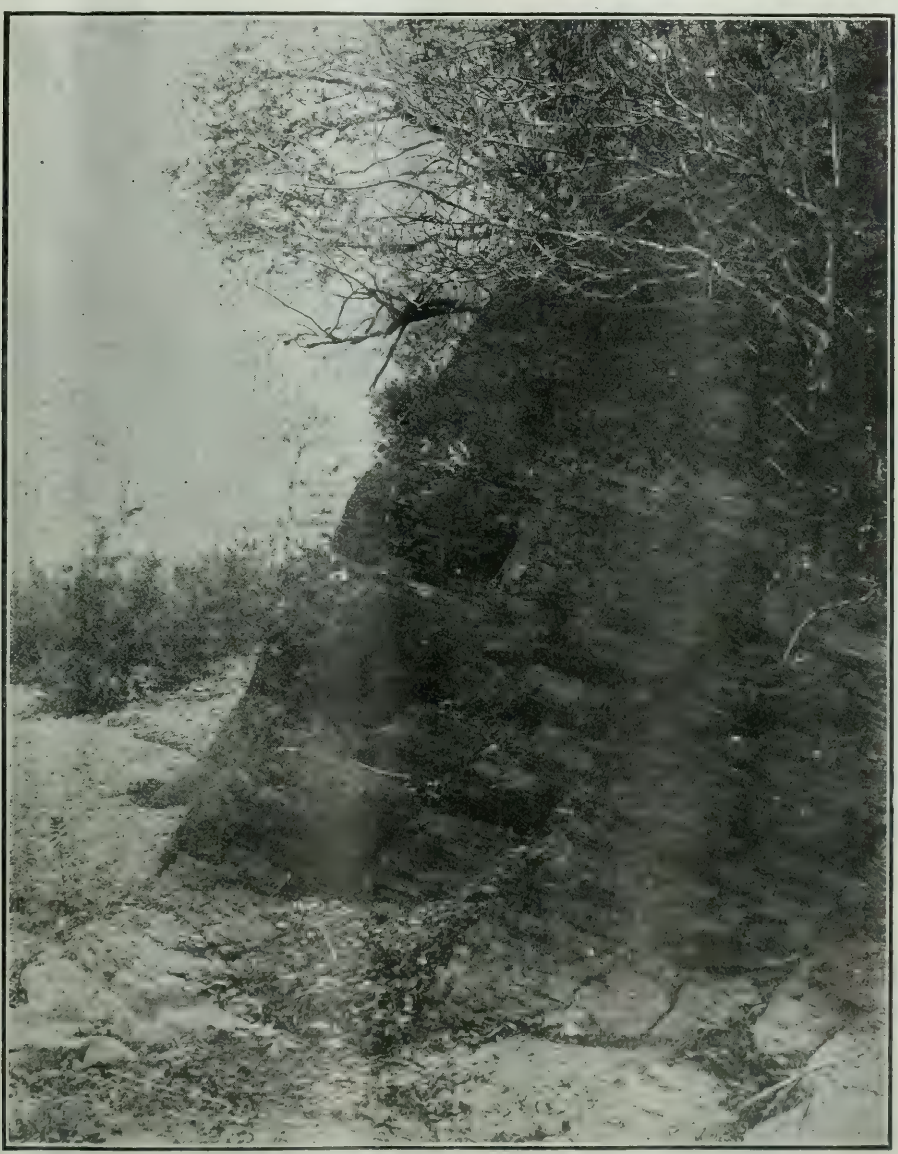
A Vast Area.

Reference to the accompanying map clearly shows the situation of the Zambesia Company's concession in relation to Beira and the new railway which is to link up Nyasaland with the existing Rhodesian systems. The map also shows the size of the concession. The mineralised area is in point of fact almost as large as England, and we understand that the most recent analyses of the coal seams have given very encouraging results. These coal areas were referred to by Dr. David Livingstone in his "Missionary Travels in South Africa," but only recently has any serious effort been made to develop the coal areas.

The Company's Policy.

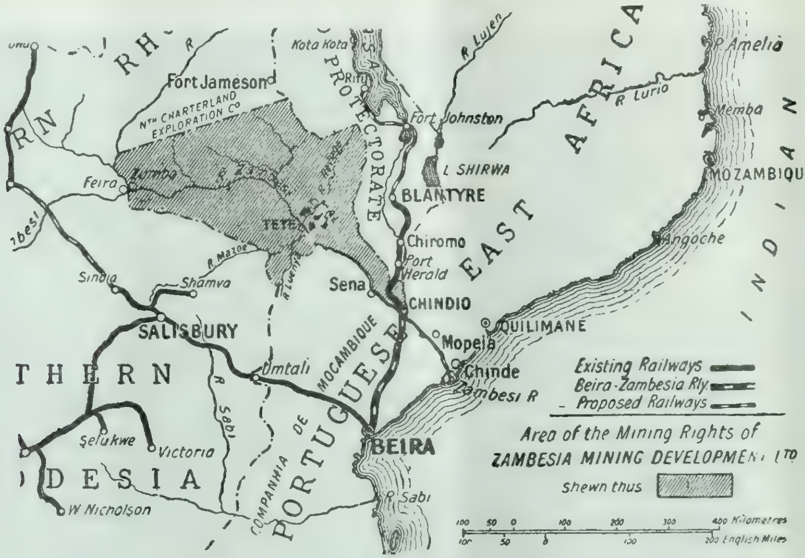
Sir Alfred Sharpe, chairman of the Zambesia Mining Development Company, stated in London a few weeks ago that most satisfactory technical reports had been received in regard to the property. He said, *inter alia:*

We have already received a preliminary report upon the property of your company from Mr. Greene and Mr. Cunningham-Craig, from which I call your attention to the following encouraging extracts: "It seems that coal is, for the present at least, the most important, since if a coal-



Another View of a Zambesi Coal Seam.
A Powerful Company is now engaged in opening up this extensive field.

mining industry can be successfully established, railways will naturally follow, and other mineral developments can be attacked in turn. As to the occurrence of thick and workable seams of coal, there seems to be no doubt whatever. From a knowledge of the coal measures in the Union of South Africa, and from information from Rhodesia, it may be accepted that the coal measures of the Zambesi are of the same age and occur in similar environment. That is to say, we have an irregular surface of crystalline and metamorphic rocks upon which the coal-bearing series of Triassic age rests in inliers rather than in structural basins. . . . The analyses show the coal to be somewhat high in ash, like nearly all South African coals, but the percentages of volatile matter and fixed carbon are good." An analysis by Mr. Campbell, Director of Mines of the Companhia da Zambesia, gives: Ash, 13·2 per cent., grey and infusable; coke, 75 per cent., grey, spongy, and crumbly; fixed carbon, 60 per cent. approximately; calorific power, 12,400 B.T.U.; calories, 6,900; evaporative power, 12·86. The report of Mr. Greene and Mr. Cunningham-Craig goes on to say: "Samples of all parts of the seams should be sent to this country for examination, as some of the least promising bands may be valuable retortable material. There are several seams of good torbanite associated and in contact with coal seams in the Transvaal; these are not at present being worked, but have proved by microscopic and chemical examination to be very rich, in some cases yielding as much as 60 to 85 gallons of oil per ton. They frequently resemble shales, and are taken for shales, and thus not carefully examined. The discovery of workable torbanites would be of very great importance and value to the company, as all supplies of oil and petrol must be imported at present. As regards the coal itself, retorting tests made in this country will also, no doubt, prove to be of great assistance. The occurrence of iron ores in the coal measures is another important point. Workable iron ore deposits near the coal workings would be of immense value at a later stage. One of the most favourable points with regard to the mineral development of the concession is that the coal measures lie unconformably upon crystalline and metamorphic rocks which contain metallic ores. Thus coal and ores may be found in close proximity, which will enable the latter to be mined more cheaply. The copper prospects do not seem very promising so far as they have been opened up to the present, but their mode of occurrence certainly suggests the possibility of richer deposits being discovered. . . . It is almost certain that some locality will be discovered where there has been a considerable concentration of these metallic compounds, and profitable mining will be the result. Dealing with the little that is known of the mineral riches of the concession, it is not too much to say that the position is very promising." Some little time ago the company appointed as engineer Mr. V. S. Rowbotham, who has had a large experience in South African colliery work. He is now at work investigating the coal seams east of and near Tete.



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SHOULD THE STANDARD VALUE OF GOLD BE INCREASED?

Advantages Claimed for the Change—Great Fillip to South African Gold Mining and General Prosperity—Is it a Will-o'-the-Wisp?

SHOULD the standard value of gold be increased? That is the latest phase of the currency question. It is claimed that as practically throughout the world gold has ceased to be a currency, serving now only as a basis for it, and the old standard value of about £4 5s. per oz. troy being retained, the base supporting the enormously expanding paper currencies of the civilised nations has shrunk to insignificance. Serious economists and bankers have been casting about in their minds for some new method of establishing this currency, and have turned to the question of increasing the standard value of gold as one possible means. This presents many difficulties for, although the market value of gold as a commodity now exceeds by nearly 50 per cent. the old standardised currency value, the increase in the latter to, say, even 100 per cent., making the present sovereign actually worth £2, would in no way create a base strong enough to support the enormous superstructure of modern (principally War-created) currency requirements. One very important phase of this question, and one of considerable promise also as to its partial, at any rate, adequacy is its contemplated effect on gold production. At the present time gold mining is labouring under huge disabilities which are too obvious to need being described here, and the new standard, if universally adopted, would mean a regeneration of the whole industry and a great accession of wealth in the value of scrip holdings, even if the State participated largely in the extra profits earned by mines whose output value was increased by 50, or even 100 per cent., according to the adopted standard. The incentive to further production would be very great, and must soon reflect itself in an enlargement of the bases upon which the enhanced paper currencies rest. As one of the countries soonest to profit by such an act of economic legislation, the subject is of paramount importance to South Africa. We now have a vast number of moribund and extinct mining ventures which would be revivified and become prosperous; offering employment on a very extensive scale, and enabling us from a new source of wealth to more readily and easily shoulder the financial burden we must carry from now on. Though the question of economic juggling will be raised by many who are well enough versed in the world finances, this is still insufficient to refute the probability of the great advantage which will accrue to the Allied nations, and especially to the British Empire and the United States, by a new (increased) standard value of gold, whether this is made permanent or subject to a revision, say, in 20 years' time. Several sound thinkers on economics favour the theory, and of a necessity the altered financial relations between the Powers during the last four or five years, the unprecedented currency inflations, the internal and external obligations of the State, the increases in taxation and commodity values, and the required adjustments of labour conditions, all conduce to the revision and readjustment of economic theories.

The present gold holdings of the world are largely in the hands of the Governments or the Governments' bankers, and the adoption of the new standard would be of direct advantage to all the Governments concerned in increasing, in this respect, their power to meet obligations. By an international act, such as proposed, the following advantages would, it is claimed, be gained:

1. An enhanced support for existing currencies.
2. Increased production of gold.
3. An addition to the wealth of each Government with a substantial present gold reserve.
4. The best form of subsidising and making profitable all gold mining ventures.
5. A largely extended field for well-remunerated employment.

While the world has taken with comparative calm the universal inflation of currencies and the rise in the scale of prices and of wages, which, though not uniform, are general, it is not likely that it will be upset by the bringing up of the standard of this basic commodity to its market value or something reasonably in the vicinity of it. This is not an inflation, but an adjustment, and, in the present state of international ledgers, is claimed to be a necessary and a rational one.

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RESULTS OF NOVEMBER, 1919, SURVEY EXAMINATION.

Total Men Passed ... .. 7 (four conditional).
Our Students, Passed ... 6
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We have secured the larger proportion of the Overseers' passes during 1919 and 1918. In the last (Sept.) Managers examination we secured 50% of the total metalliferous certificates granted, and in the previous examination the larger proportion of the total passes. Write for particulars and class time table.

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THE LATE LIEUT.-COL. DONALD MACAULAY.

Passing of an Outstanding Personality in the Medical and Mining World—His Services to the Industry—A Pioneer in Miners' Phthisis Study—Notable War Record.

the O.C.'s friend. He loved his little ship and everyone

With the deepest regret, we have to record the death this week of Dr. Donald Macaulay, which occurred in a motor accident within a few yards of his home at Cleveland. The late Dr. Macaulay was one of the outstanding personalities of the mining and medical world of the Rand, and his passing leaves a feeling of personal loss throughout every section of the community. During the War, he commanded the hospital ship "Ebani," holding the rank of Lieutenant-Colonel; and the esteem and affection in which he was held by the 43,000 sick and wounded who passed through his hands in that period are put on eloquent record by another pen hereunder. Dr. Macaulay's services to the mining industry in the last twenty years were not less distinguished than his War record. Soon after the Boer War he started to investigate the question of miners' phthisis and its deadly incidence on the miners of the Rand. His monumental labours in that field in collaboration with Dr. Louis Irvine are on record and provide historic proof of his pioneer efforts to study and stamp out that scourge of the mines. Later, of course, the work passed into other hands, and we all know with what success the industry has since grappled with the evil. But credit must remain with the late Dr. Macaulay and his distinguished colleague for being first in the field to diagnose the extent and seriousness of the disease. For his papers on the subject, read before the Chemical, Metallurgical and Mining Society, Dr. Macaulay was awarded—as likewise was Dr. Irvine—a special gold medal struck to the order of the Society at the Royal Mint. This he treasured as one of his dearest possessions. In regard to the natives under his care on the mines, he was ever keenly alive to their interests, and during his years on the Rand he probably did more than any other single individual to ameliorate their lot and improve their surroundings. A notable reform, introduced by the mines at his suggestion, probably saved the industry an enormous sum in money and saved the health and lives of countless native mine-workers. Having read the published results of the brilliant research done by two of his countrymen in regard to the value of rice as a food, and the necessity for retaining some of the coarser elements to complete its dietic value, he had the inspiration to apply the same reasoning to the mealie meal as supplied to the mine natives. At his instance, the coarser elements of the meal were retained with the meal by the millers, with the result that scurvy and other diseases traceable to the superfine meal were eradicated from the mines. This is but one of many instances that might be quoted where the late Doctor's native wit and shrewdness saved the industry an incalculable amount in the lives of its native workers. His genial and attractive personality secured him a unique position in social circles on the Rand, and it is not too much to say that his personal influence with the leaders of the industry played a large part in awakening them to the economic value of conserving the health of the native mine workers. Some months ago, we were privileged to be shown over the splendid new native hospital at the City Deep—to which he was one of the surgeons—and in writing of it in these columns we put on record the following appreciation of what Dr. Macaulay had done in the cause of medical science on the mines:

"It may be of interest to recall," we wrote, "the gradual process that has gone on of educating our mine administrators up to the proper appreciation of the economic as well as the humanitarian value of conserving the health of the native worker on the mines. Those of us who remember the conditions on the Reef fifteen or twenty years ago will readily recall the primitive nature of the surroundings in white as well as in native hospitals. Even up to a little while ago native wards, particularly, were nothing to be proud of, and made a dismal and dingy picture compared with what to-day can show. Beginning after the Boer War, our mine medical men, foremost among whom were Drs. Macaulay and Irvine, started a campaign of enlightenment that, wisely enough as it proved, began with those at the top. Among the first, also, of our mine administrators to waken to the economic value of attention to health questions was Mr. Samuel Evans, and largely through his efforts and influence, the Corner House group of mines has always led the van in this excellent movement. Through his instrumentality, Colonel Gorgas was commissioned to report on health conditions on the mines, and the appointment of his able lieutenant at Panama, Colonel Orenstein, as Chief Medical Officer to the Central Mining—Rand Mines Group was a direct consequence that has in its turn been fruitful of further excellent results."

The Late Lieut.-Col. Donald Macaulay.

The wide and deep esteem in which the late Doctor was held was shown on Thursday by the presence at his funeral of large numbers of his professional and lay friends. His passing has left a gap in the life of the Rand that will be hard to fill: In him the industry has lost a valuable servant, the medical profession a distinguished member, and the whole community one of its most public-spirited and lovable personalities.

A Tribute from a Returned Soldier.

"O. L.," who served in the War with Dr. Macaulay, contributes the following appreciation:—

Thousands of returned soldiers will have learned with deep regret of the tragic death of Dr. Macaulay. On his "little ship," as he loved to call the "Ebani," Colonel Macaulay transported the human wreckage of war from South-West Africa, from East Africa and from the Mediterranean to the base hospitals in the Union and England. Many of his patients "Doctor Mac" had known in other fields of strife—in the daily striving of mankind against the hard silica of the Witwatersrand. But whether "his boys" were known to him in the pre-War days along the Reef or not, every passenger on that ship was in very reality who ever travelled aboard her, and by his untiring efforts and cheery presence he transformed the "Ebani" from a ship of pain into a galleon of comfort. I can see him now toddling along the wards, a kepi cap perched on his head, and his face positively beaming with enthusiasm for his job and for the welfare of "his boys." He had a cheerful word or a joke for everybody. I recollect that I was a corporal at the time, and when I was able to get out of bed and stand at attention alongside my cot for the C.O.'s parade I used to realise what a real delight it was to the Doctor to be able to serve his country during those eventful days that now seem so long ago.

One morning when the usual question was put to me I answered in the usual way, "Oh, I'm feeling very much better, Sir." Dr. Mac. looked at me closely. "All the same, Corporal, I don't think you're looking too fit this morning. Report to me in my cabin after this parade." The C.O. and the Senior Sister with the Medical Sergeant-Major and the orderlies passed on, and half-an-hour later I knocked at his cabin door. "Come inside," he shouted. "And now for the moment we can dispense with the 'Sir' and the 'Corporal.' You'll find the cigarettes on my desk, sit down and have a chat."

But he knew the value of discipline too, and on the rare occasions, when one of "his boys" had to be put on the peg the C.O. measured out justice with a firm hand, although he hated anything in the nature of punishment just as much as he gloried in the comfort of his boys in blues. He had a wonderful fund of anecdote and experience to relate. In the Eastern Mediterranean a submarine held him up one day and the Doctor never ceased to gloat over the story of a destroyer's sudden appearance and the equally hurried disappearance of Fritz.

Soldiers in many parts of the world will grieve to hear that the Doctor has gone forth on his last voyage. He took the rough edges off war for many thousands of us during our sojourn on his boat, and I verily believe that a kinder and bigger-hearted little man never lived.

O. L.

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67 FOREIGN BRANCHES.

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PORTO RICO—San Juan, Mayaguez and Ponce. COSTA RICA—San José.
DOMINICAN REPUBLIC—S. Domingo, Puerto Plata, Sanchez, S. Pedro de Macoris and Santiago de los Caballeros.
MARTINIQUE—Fort de France.
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VENEZUELA—Caracas, Ciudad Bolivar, Maracaibo and Puerto Cabello.
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IT IS THE GARGOYLE—the world symbol of scientific lubrication.

The red Gargoyle appears on cans and barrels which leave Vacuum Oil Company refineries scattered over the globe.

The red Gargoyle points the way to correct lubrication on six continents. It hangs out over garage doors in every country where motor cars are a factor. In the ports of the world it is looked for by owners of steamships.

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A grade for each type of service.

VACUUM OIL COMPANY OF SOUTH AFRICA, LTD.

THE WEEK IN THE SHAREMARKET.

Quiet but Firm—Good Undertone—Workers' Demands.

THE market at the moment of writing is quiet but firm. There is quite a good undertone, and most people are inclining to the view that whilst the workers will ballot for a strike they will concede the ridiculous request for a 40 hours' week and that the Chamber of Mines and the men will come to a satisfactory compromise in regard to pay. On Monday a shoal of overseas buying orders advanced prices all round. Modder Bs., which have been a weak feature of late, bounded up to 169s., and Springs Mines advanced to 59s. Prices have, however, since receded in the absence of further buying orders from London on account of cable delays. The premium on gold has gone still higher, and it is felt on all sides that if the labour outlook brightened to any appreciable degree we should have a very active and rising market. Diamond stocks have been steady but dull. Crowns maintain their level around 14s. 3s.—14s. 6d. Frank Smiths are steady at 8s. 6d. ex rights, and Roberts Victors have been done at 18s. 6d.—19s. Negotiations are proceeding for re-opening this property. Oil shares await news in regard to the option over the African Oil property. Tins have been quiet. Transvaal Silver and Base Metals have been dealt in at 63s., and the options are wanted at 23s. 9d. At this latter price they appear to be a most attractive buy.

	Fri., 23rd.	Sat., 24th.	Mon., 26th.	Tues., 27th.	Wed., 28th.	Thurs., 29th.
African Farms ...	16 0†	15 0	13 0*	15 3	15 3*	15 3*
Anglo-Americans	51 6	50 6	51 3*	54 6	53 0	55 0
Apex Mines	8 0†	—	7 6†	7 6†	7 6†	7 0*
Bantjes Cons.	4 0*	4 0*	4 6	4 6*	4 3*	4 3*
Blaauwbosch Diamonds	80 0†	80 0†	—	80 0†	—	—
Brakpan Mines	67 0*	67 6*	67 6*	68 0*	68 0*	68 0*
Breyten Collieries	8 6	—		—	12 6†	12 6†
Brick and Potteries	4 6*	4 6*	4 6*	4 6*	—	4 6*
Bushveld Tins ..	1 10*	1 10*	2 0*	2 0*	2 1*	2 3
Cassel Coals ...	30 0*	—	—	30 0*	30 0*	30 0*
Cinderella Cons.	7 0*	—	7 0	7 0*	8 0†	8 0†
City Deeps ...	—	61 0*	61 6*	61 0*	—	—
City & Suburbans ..	7 3*	7 6*	7 3*	7 0*	7 3*	7 3
Clydesdale Collieries	25 6*	26 0*	25 6*	25 0*	—	25 0*
Cons. Investment	33 9*	33 9	33 9*	33 9*	33 9*	33 9*
Cons. Langlaagtes	23 0†	21 0	—	23 6	23 0*	23 0*
Cons. Main Reefs ..	13 9	13 9	14 0	14 6	14 0*	14 0
Cons. Mines Selection	31 0*	31 0	32 0*	33 0	32 6*	33 6*
Coronation Collieries	70 0†	—	—	70 0†	70 0†	70 0†
Coronation Freeholds	2 4*	2 4	2 4*	2 6†	2 4	2 5†
Coronation Syndicates	14 0*	14 0*	15 0	—	15 0	15 0*
Crown Diamonds ..	14 3*	14 9	14 6	14 3	14 6	14 0*
Crown Mines ..	66 0*	66 0*	68 0	70 0*	69 0*	72 0
Crown Mines Debentures	—	—	—	—	—	£97*
Daggafontein Mines	19 9	19 9*	21 0	20 6	20 0*	20 3*
Do. Options (4 years)	0 6*	0 9	0 9	1 0†	0 6*	0 6*
East Rand Coals	—	2 6*	—	2 6	2 6*	—
East Rand Deeps	1 1*	—	1 2*	1 2*	1 1*	1 2*
East Rand Minings	—	—	—	—	22 0*	—
East Rand Props.	9 8	9 7*	10 9	11 0	11 3	11 9
East Rand Debentures	—	£65*	—	—	—	—
Eastern Golds	1 7*	1 7*	1 7*	1 7*	1 8	1 7*
Ferreira Deeps ...	—	—	—	12 6†	10 6*	13 0†
Frank Smith Diamonds	11 6B	11 6*	7 9*	8 3	8 1½	8 6*
Geduld Props.	52 6†	57 0*	51 6	53 0	54 0	53 9*
Glencoe Collieries	5 0*	—	—	—	—	—
Glynn's Lydenburgs	17 6*	19 0†	17 6	—	—	—
Government Areas	97 0	95 0	97 3	96 0	99 0	98 6
General Minings	—	10 0†	—	—	—	—
Hume Pipes	22 0*	21 0	23 6*	21 6*	24 0*	24 6
Jhb. Board of Executors	35 0*	—	35 0*	35 6	35 0*	35 6*
Jupiters	5 6*	5 3*	5 6*	5 6*	5 3*	—
Klerksdorp Props.	2 1*	2 1*	2 1*	2 1	2 1*	2 0*
Knight Centrals	6 9*	6 8*	6 9	7 0	6 9*	7 6†
Knights Deeps	8 6*	—	—	10 6*	10 6*	10 6*
Lace Props.	20 0†	—	—	20 6†	17 6*	—
Leeuwpoort Tins	31 3	30 0	30 3*	30 6*	30 9	30 3
Lydenburg Farms	7 9	7 9	7 9*	7 9*	7 9*	7 10*
Langlaagte Estates	—	—	—	—	18 0*	—
Meyer & Charltons	—	—	—	—	90 0*	—
Middelvlei Estates	—	—	2 4†	—	2 4	—
Modder B's	158 0	156 6	161 0	16[illegible]	161 0	162 0
Modder Deeps	52 3	52 0	53 3	54 1½	54 0	53 6*
Modder Easts	28 6	28 3	28 7½	28 9	28 6*	28 4½
Do. Options (3 years)	8 6	8 0	8 9	8 7	8 6	8 2*
Do. Options (4 years)	11 6	11 6	12 0	12 0	11 9	11 6*
Natal Navigation Colls.	—	—	—	—	—	26 6*

	Fri., 23rd.	Sat., 24th.	Mon., 26th.	Tues., 27th.	Wed., 28th.	Thurs., 29th.
National Banks	£14*	£14½*	£14½*	£14½*	£14¾†	£14½*
New Boksburgs...	—	—	—	—	2 0	2 0
New Eland Diamonds	70 0*	75 0*	—	70 0*	75 0*	72 9*
New Era Cons. ...	9 9*	9 9*	9 9*	9 9*	9 9*	9 6*
New Geduld Deeps ...	2 1*	2 0*	2 3*	2 2*	2 2*	2 2*
New Heriots	—	10 0†	—	10 0†	10 0†	—
New Kleinfonteins ...	12 9	12 6	—	13 3*	13 6	13 3*
New Modders ...	£32¾A	£32	—	£32¾A	£32½A	—
New Unifieds	6 0†	4 9*	5 3*	6 0†	—	—
Nigels	7 0*	7 0*	7 0*	7 0*	7 6*	7 6*
Nourse Mines	14 3*	14 0*	14 3*	14 0*	14 6*	14 7½
New State Areas	28 3	28 0*	29 0	29 9	29 6A	30 0A
Premier Preferreds	—	—	£11*	£11*	—	—
Pretoria Cements	95 6	96 6	95 6*	95 0*	95 6	95 0*
Princess Estates	3 0†	2 3	2 6*	2 3*	2 6*	2 6
Rand Collieries	3 9*	3 9*	3 9*	3 9*	4 3†	—
Rand Nucleus	2 0*	2 1*	—	2 1*	2 1	2 3
Rand Selections	100 0	102 0B	102 6*	105 0	106 3	105 0
Randfontein Deeps ...	6 6	6 9†	6 6*	6 0*	6 6*	6 6*
Randfontein Estates ...	23 0†	23 3	23 9	24 0*	24 6*	25 3
Roberts Victors...	18 6*	17 3*	18 0*	18 3*	19 0	18 0*
Rooibergs ...	10 3*	10 3	10 9	10 9	11 0	11 0
Roodepoort Uniteds ...	—	7 0†	7 0†	7 0†	—	4 9*
Ryan Nigels ...	—	4 3†	—	4 2†	—	—
Rouxville Diamonds ...	24 6*	24 6*	25 6	25 6*	26 0	25 0*
Southern Van Ryns ...	7 9	7 6*	8 0	8 0	8 0*	8 9
S.A. Alkalis ...	25 0*	25 3	25 3	24 0*	22 6*	21 3*
Shebas ...	2 6*	2 9	2 6*	2 6*	2 9	3 0
Simmer Deeps ...	3 0*	—	3 0*	3 3*	3 3*	3 3*
S.A. Lands	6 0	6 0*	6 1*	6 2*	6 2	6 3*
Springs Mines ...	55 6	55 6	57 6	57 6*	57 0*	57 6
Sub Nigels	17 1*	17 3	17 0*	17 3*	17 6*	17 6*
Transvaal Lands ...	—	17 0*	—	—	—	—
Swaziland Tins	—	—	—	—	14 0*	14 0*
Tudors ...	1 5*	—	1 5*	1 5*	—	—
Transvaal G.M. Estates	18 0†	—	17 3*	17 0*	16 6*	17 3*
Union Corporations ...	—	—	—	22 0*	22 0*	22 0*
Union 5 per cent.	£105	£105	£104¾	£105†	3104¼*	£104¼*
Union 4½ per cent. ...	£102½*	£102½	£102½*	£102½*	£102½*	£102½*
Union 5 per cent.	£105	£105	£104¾	£105†	£104¼*	£104¼*
Victory Monarchs ...	45 0*	45 0	45 0*	45 6*	45 6*	46 0*
Van Ryn Deeps	90 0A	92 0*	95 6	97 3	97 0	98 0
Village Deeps ..	14 0*	14 6*	—	15 0*	15 0*	14 6*
Village Main Reefs ...	—	8 6†	8 6†	8 6†	8 6†	8 6†
Van Dyks ...	—	—	2 9*	2 9*	3 0†	3 3†
Western Rand Estates	—	9 0†	[illegible]	—	10 0†	—
Witwatersrands	—	—	17 6*	17 6*	18 0*	—
Wit. Deeps ...	9 9†	10 0†	10 3	10 0*	10 3*	10 6
Wolhuters ...	5 3*	5 1*	5 3	5 4*	5 3*	5 3*
West Springs	23 1½	23 0	23 6	23 9*	24 6	24 3*
Do. Options	7 6*	7 6	7 9*	8 2	8 1*	8 0
Zaaiplaats Tins	11 9*	12 0	11 9*	12 0	12 3	12 0

*Buyers. †Sellers. AOdd lots. BEx London.

PERSONAL.

The list of certificates issued by the Mines Department for the period ended 21st January, 1920, is as follows: Mine Overseers' Certificates (Metalliferous Mines): A. E. Cameron, P. Cole, C. K. Power, H. C. Rees, H. W. Sewell. G. M. Young.

* * * *

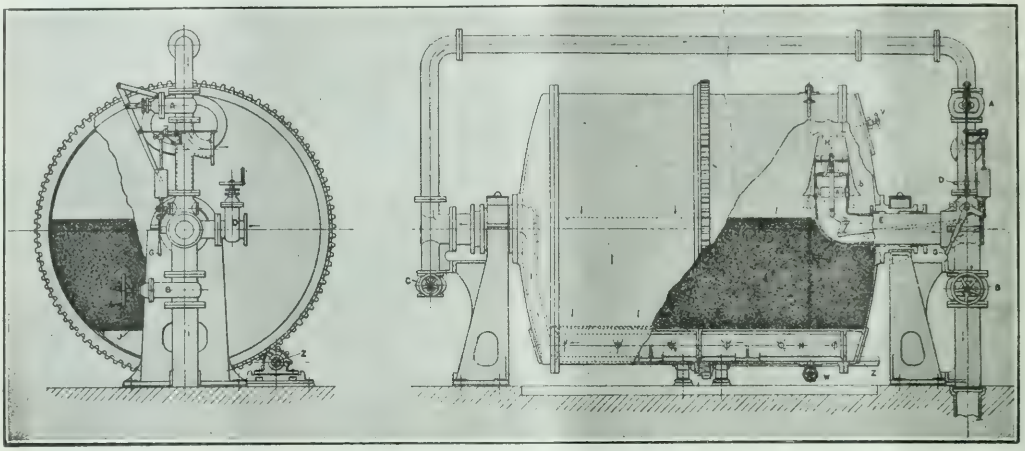
We learn that the directors of the South African and General Investment and Trust Co., Ltd., have appointed Mr. Raymond Des Clayes to the position of General Manager of the company in South Africa. Mr. Clement Davies, the Managing Director of the company, is at present on a business visit to this country

* * * *

Messrs. Vickers are consolidating their interests in this country by the formation of a company to be known as Vickers (South Africa), Ltd., with branches and agencies in all the chief centres. The company will be managed by Messrs. Dowson & Dobson, Ltd., the newly floated joint enterprise of Messrs R. M. Dowson and J. H. Dobson, both of whom are expected to return to the Rand in February.

THE "TURN-OVER" FILTER.

For the Purification of Water for Town Supplies and various Industrial Purposes.



A	Outlet and Wash-Water Valve
B	Wash Water Valve
C	Starting Wash-out Valve
D	Inlet Valve
G	Syphon Valve Handle
V	Air Valve

The chief feature is the method adopted to cleanse the filter bed, and on this ultimately depends the constant, regular, efficient working of the filter.

The "Turn-Over" system of cleansing was designed to overcome previous difficulties experienced in the thorough cleansing of the filter bed.

The main objects achieved by the "Turn-Over" system are :—The displacing and cleansing uniformly every portion of the filtering material from top to bottom of the bed; the thorough cleansing of the whole bed without being dependent on a voluminous reverse flow of water under high head from nozzles, and the dispensing with the use of other common forms of agitating gear (which all have their objectionable features) such as rakes, revolving arms, etc, steam jets, or compressed air. The "Turn-Over" system effects a thorough cleansing with a comparatively slight reverse flow of cleansing water at a low head, and can therefore work where other systems are impossible.

CLEANSING.

The cleansing operation is performed by revolving the whole chamber and completely upsetting the whole filtering material, whilst the slight reverse flow of cleansing water is admitted to wash out the impurities.

The claim that this system leaves the filtering material absolutely clean throughout has been repeatedly verified by examinations made by interested engineers after the filter has been years at work.

By the arrangement of syphoning the dirty wash-water is quickly got rid of and the least possible amount is used.

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ENGINEERING SECTION.

WATER FILTRATION.—II.

Advantages of the Closed Filter as compared with the Open American Type Filter—with some mention of the Constructive Advantages and Disadvantages of various types of Patent Mechanical Filters.

Now in all mechanical filters the crucial feature is the method of cleansing; to be efficient a filter must arrest the dirt and the bed must get dirty and the best system of cleansing is the one which cleanses the bed most uniformly and efficiently from top to bottom. In one well-known British type filter nozzles, reverse flow and rakes are used to assist in the agitating and breaking up of the filtering material. Some American type filters depend on the use of nozzles with reverse flow assisted by compressed air and sometimes steam. The drifting-sand filter, as its name implies, is a filter in which the surface, and the surface only, of the bed is continually being washed, the under portions remaining stagnant, which in the minds of some authorities is a very serious drawback. Another well-known English make of filter has nozzles, reverse flow of water, and an impeller inside to agitate the filtering material. There are a number of filters which depend more or less on the same system of cleaning simply by reverse flow with different arrangements of nozzles; some of these, both American and British, have some distinctive feature, such as aeration or oxygenating devices, incorporated in them. There is one filter of British manufacture which does not depend on nozzles or any internal mechanically operated agitators to assist in the breaking up of the filtering medium; in this filter the process of cleaning is unique in method; it consists of reversing the flow through the trunnions on which the cylinder, containing the filtering medium (quartz of one uniform grade) is free to rotate, the axis being horizontal; and at the same time oscillating the filter by power in increasing range until the filter is completely revolved a number of times, when the oscillations are gradually reduced until the cylinder part of the filter plant is brought again to rest in its normal position, which ensures that the top of the filtering medium is in a horizontal plane. The cylinder is arrested a number of times during the process and in any phase of its oscillation and the dirty water syphoned off; the process, which is very expeditious and simply operated, being continued until the water syphoned off shows clear. The effect of the oscillations and revolutions of the cylinder about the trunnion axes, assisted by the comparatively small reverse flow of water, has, of course, the desired effect of breaking up and separating each particle of the filtering medium and at the same time effectively scouring every particle by means of the reverse flow and the rubbing action of the particles of quartz against one another. The filter chamber is also scoured at each cleaning operation by the movement of the filtering medium; and the absence of corners and areas round nozzles found in other makes, from which it is practically impossible to remove all portions of the bed and in which portions impurities gradually accumulate, decompose and ultimately affect the filtering efficiency, coupled with the fact that there are no internal working parts, such as revolving arms, pipes and nozzles, to get out of order (necessitating the opening up of the filter periodically for repairs or inspection), makes this particular filter appeal in this particular and important respect very strongly to the calculating engineer.

The various systems employed in various rapid filters, both of the open and closed types, are generally as above described, or rather sketched, in their essential detail of functioning, from which it will be seen that there are really only three distinctive types: (1) those depending on nozzles and mechanically operating agitating devices in the cleaning process; (2) the drifting-sand type; and (3) the filter, more fully described as to its design than the other types mentioned above, the filtering chamber of which is oscillated and revolved during the process of washing the filtering medium.

It may be added in emphasis of this particularly important phase of the subject of rapid filters, namely, that of the cleaning of the filtering medium efficiently and economically, that it is well known by all that have had experience with rapid filters mechanically cleansed that reverse jets of water alone, or assisted by air or steam, do not give uniformity of cleansing, assisted by rakes helps to produce uniformity, but with all these different devices it is practically impossible to remove all portions of the bed from the corners of the filter and between the nozzles. In these portions impurities gradually accumulate and ultimately affect the filtering efficiency of the filter. There is no doubt that the type of filter made by a British firm with an impeller inside does efficiently wash the filtering material, but the principal objection to that system is having an impeller working at a high speed inside the filter, out of sight, subject to considerable erosive action and impossible to properly lubricate. In the drifting sand system of filtration practically all the bed except a top layer remains undisturbed and becomes, or tends to become unless specially dealt with, absolutely filthy with a bad water or a turbid water, such as that drawn direct from rivers.

The best test of the efficiency of a water cleansing system is its capacity to deal with a really bad water, and many filters are absolute failures when they are put to do such difficult work, especially when the water to be filtered contains a certain amount of colloid matter, and any filter system which was the outcome of difficulties experienced when dealing with bad river waters containing effluents should be worthy of inquiry and investigation by engineers interested in the subject. In cases where a rapid filter plant of any tyre or make has been installed for some time and has been dealing with such a water a record of its performance and filtering efficiency can generally be got by reference to the engineer concerned and that record should give a reliable indication as to its advantages or disadvantages and its suitability or otherwise to operate successfully under those conditions for which the inquiring engineer may be requiring a rapid filter plant.

Enough has been said in this article on the constructural advantages and disadvantages of various rapid filter systems. The question of the adaptability of the closed type of rapid filter compared with the open American type of filter has been touched upon. In South Africa and in other countries where water supplies are often taken from large rivers it is invariably the practice to provide for primary sedimentation and usually a clean water tank or well. It is not proposed to deal here with all the points regarding the advantages of sedimentation and the reason for its adoption, but generally speaking it is found that even though the filters might be able to deal with a moderately turbid water without primary sedimentation, still with primary sedimentation it provides sufficient time for the coagulent to act, that is to say, for the chemical action to take place and thus give a considerable saving in coagulent; this is of course very elementary, but since firms quoting for filter plants usually specify and quote for the supply of their own type and make of coagulent treatment apparatus the point in relation to the selection of a suitable filter plant is important, since coagulent treatment is such a costly item.

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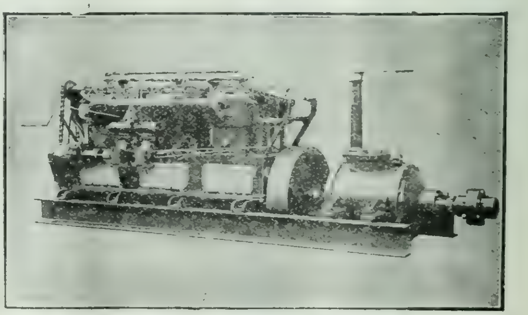

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TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Business Quiet Through Electioneering—Record Price of Gold—The Trend of Affairs—Agricultural Show—Timber and Paints—S. African and British Manufacturers: A Hopeful Sign—Iron, Steel and Machinery—Electrical Goods—Dynamite.

Business throughout mining material and iron and steel circles is exceptionally quiet without any apparent outstanding reason. However, some people have an idea that the ballot in connection with the strike has something to do with the quietude of the mines, as well as taking all the vim out of business generally. Then the forthcoming election next month has also a restricting tendency. Nevertheless people are very hopeful that, with a lot of diplomacy and give and take on both sides, the strike will be averted and other things fairly fixed up. Of course, the price of gold being £5 14s. 6d. is the touchstone for optimism. As previously remarked, the anticipated difficulty of obtaining hardware goods from both Britain and America has not in any way lifted, but if anything has become more manifest. For example, a merchant says that one of his British agencies for iron and steel has advised him that they are not looking forward to export business for the next two years, as they have enough orders on their doorstep fully booked up for that period. A similar remark was made by one of the chief American indent houses in Johannesburg, as they have almost stopped taking orders in consequence of the rate of exchange and the manufacturers also having plenty to do for their own home consumption and the pressing orders from Europe. A few of their customers have ordered small quantities of steel plates and parts of standardised machinery irrespective of guarantees as to when they are likely to be delivered or the high rate of exchange. A merchant in Johannesburg is not troubling overmuch as regards dealing with America, primarily on account of the high exchange and the difficulty of arranging a credit in New York. He has an idea that we are almost running along the top of the high exchange, as America is seeing the necessity of doing something in that respect to save their export trade from collapsing altogether. Another American house says it is not at all clear how the rate of exchange is likely to alter for a very long while to come. However, there are many signs that the world is moving forward, and when a good start is made things may alter more quickly than our present limited knowledge seems to indicate.

The Trend of Affairs.

There are healthy signs that South Africa is settling down to business, as, for example, there are more enquiries for partners in various kinds of enterprise. One is wanted for a slimes proposition which may be opening a big field of enterprise for dealing with the original tailings and slimes throughout the Rand. The question of the exchange is being taken up more vigorously, as the Chamber of Commerce at Pretoria had a full dress debate on Tuesday and the correspondence columns of the newspapers are freely used to expound the subject in its many bearings, but so far no other plan has yet been promulgated, but hopes are running high that some good scheme will eventually come about. The Municipality has accepted a tender, out of some half-dozen, for six months for the fat at the Abattoirs at 10d. per lb., being somewhere about the price of farmers' butter in pre-War days. Local butter on our market is from 3s. to 3s. 10d. per lb. and co-operative creamery butter is expected to be 4s. 9d. per lb. retail on Saturday. The best local forage is 16s. 3d. per 100 lbs. and yellow mealies 34s. 6d. per bag of 200 lbs. Buyers of seed potatoes are anxious to secure suitable lots as a scarcity is feared later on. Onions and tomatoes are extra plentiful, therefore cheaper.

Agricultural Show.

Our annual show will be held on the 31st March to April 5th. Entries must be sent to the Secretary not later than March 6th, excepting entries for the bulk butter classes, and those must be in not later than February 27th. We cannot expect many new features in agricultural machinery and implements, because of the shipping facilities being poor. Again, there is a shyness in dealing freely with America and Canada on account of the almost prohibitive exchanges. The feature of our future shows is undoubtedly the plough tractor. Here is an extract of what is happening in Britain. The recent trials of agricultural tractors held in England were highly satisfactory and reveal some interesting tendencies of design among the British makers. Owing to the heavy soils so frequently met with in England and Scotland, it is being found that the slower speed engines with ample power give better results than the light and more attractive types. The serious wear and tear due to agricultural conditions confirms the drift towards solid and simple design; and in view of the unskilled attention which tractors generally get it is being found advisable to seal up vital parts so that amateur fingers will not be tempted to interfere with them. A British firm seized the opportunity presented by the trials to give a demonstration of the double engine cable system of ploughing, using internal combustion engines. A double-ended plough is hauled backwards and forwards by means of cables wound on drums. It is claimed that a set of this tackle can plough from seven to ten acres in one day. The engines are adapted for use as tractors on the road or for driving stationary machinery.

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TIMBER, BUILDING MATERIAL, AND PAINTS.

The Baltic timber stocks are only fair—in fact, anything but plentiful. The Johannesburg yards are holding back stocks for their regular customers and only offering surplus of a kind in the open market. It is a case of taking or leaving it, although small lines can be usually had by the cash customers, excepting the long length deals, and these are not available in the ordinary way, and then at 2s. per ft. Floorings are 9½d.—10d.; ceilings, 6½d.—7d.; Oregon pine, 9s.—9s. 6d.; and pitch pine, when to be had, up to 11s. per cube. Roofing iron, 24 gauge, 1s. 6d.—1s. 8d. per ft., according to length.

Second-hand Timber and Iron.—Business in the second-hand timber and iron yards is improving and prospects to-day are brighter than they have been any time during the past two or three months. Stocks are being obtained in fairly large quantities and the drought, which is prevalent in the outlying districts, is the only cause for keeping things back. For second-hand timber and iron no reliable quotations can be given. Orders are good, but not always executable, owing to the lack of the right kind of materials, but dealers are looking forward to better business next month.

A parcel of five tons of genuine white lead was sold at 11½d. per lb.; the ordinary quotation is 95s. per 100 lbs. and 1s.—1s. 3d. per lb. for smaller lots. Linseed oil, boiled, is 120s. two-fours, and raw, 112s. 6d. Turps, 130s. two-fours, and 145s. ten-ones. Red lead, 75s.—80s. per 100 lbs. Best American salad oil, 150s. two-fours, and 160s. ten-ones, and South African 105s. Lubricating oils advanced 2s. per case during the week on account of the American exchange. The merchant giving this information said he tried to avoid business with America owing to the high rate of exchange, but in many cases it cannot be avoided. He also explained that he had opened cable communication with Australia in consequence of the American exchange. Oils were cheaper there, but so far he had not been able to negotiate satisfactory business owing to the difficulty of getting shipping freight. Business throughout the building trades is buoyant both in the demand for materials and artisans.

IRON, STEEL AND MACHINERY.

Business is unaccountably quiet for the ordinary bar iron and steel. There is a good demand for steel plates, especially the smaller sizes, as some of the sizes in the one-sixteenths are quite unobtainable. The price for sixteenths is anything between 60s. and 70s.; other thicknesses are from 45s. to 55s. British mild steel is scarce and dear, the latest quotation being 35s. 6d.; tool steel, 7½d., 9d. and 10d., up to 1s. 3d. per lb.; shovels, 50s. to 75s. per doz.; wheelbarrows, 65s. to 70s., according to quantity required. Wire nails are getting scarcer, but sufficient for daily requirements providing one is occasionally satisfied with substitute sizes, quotations are from 50s. to 63s., the first price being auction job lots. Brass rods, 2s. 3d.; and plates, 2s. 9d. per lb. Buyers of imported bar iron will not purchase as a rule at 32s. 6d., therefore business is not pushed in that direction, as it cannot be sold under at a profit. Therefore merchants are waiting until the market improves, which it undoubtedly will for all imported iron, steel and hardware goods. For example, Scottish locomotive builders have never had heavier orders booked than at present, and other British manufacturers of iron and steel goods are more than full up, according to cable and mail advices. The demand for everything in the shape of power machinery is excellent, not only for Johannesburg and the Reef but enquiries throughout the country, including occasional business for the coast ports.

ELECTRICAL GOODS.

In the electrical material market prices as a general statement are hardening all round. Tubing and wiring are plentiful now, but stocks of the former will, it is expected, be exhausted before March. Town and country business is

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good, the only trouble being to get the goods. Some lines are already getting very short. Tees and indeed all fittings for ordinary tubing are getting very scarce. Ceiling roses and adaptors are still unobtainable and many jobs are being hung up on account of the impossibility of procuring the former. In some cases low tension ceiling roses are allowed to be used on condition that they be exchanged for high tension immediately the latter arrive.

DYNAMITE.

There is at present not much indication of any reduction in the price of materials for explosives. Nitrate of lead is £47 per ton. The South African Explosives Company have now got sufficient supplies of fuse lighters on hand. Since last month there has been a slight increase in the price of fuse. Of detonators there are sufficient stocks to enable the factory to carry on for some months. Two factories are about to be erected in South Africa, which are expected to produce all the requirements of the Union in respect of detonators and do away with the necessity of importing these in future. This local industry will be welcomed as making us independent of oversea for at least one important adjunct of mining.

A HOPEFUL SIGN.

It is a fact of the greatest importance and pregnant with vast possibilities that now the Great War is over England and South Africa are bound to come into competition with one another in respect of manufactures which the great upheaval of the past five years enabled South Africa to establish here and, in the absence of any competition from overseas, to more or less monopolise. Under the altered conditions the friendly rivalry between England and South Africa will now become acute, and it behoves us to look to our laurels and see that the factories which we have established during the past few years and the hold we have obtained with our different local manufactures in the South African market shall not be allowed to decline. In this connection it is very satisfactory to note that a travelling Exhibition (the S.A. Traders and Industrial Exhibition) has been arranged to visit, about the middle of this year, the following towns of the Union, viz., Durban, East London, Port Elizabeth, Cape Town, Bloemfontein, and Johannesburg, a fortnight being spent in each town. Stalls may be secured of suitable sizes, and arrangements have been made specially to suit the young manufacturer who cannot see his way clear, owing to his business being in its infancy, to send a representative throughout the country, on account of the heavy expense incurred. Of course the exhibition cannot hope for much success without the enthusiastic support of the S.A. merchants, but with this the movement is practically assured of success. It is therefore up to the various manufacturers to push their products and bring them prominently before the eye of the public in the way indicated. It is proposed to hold three sessions each day and fourteen days in each town, making a total of 84 days in all. The promoters are convinced that the business done at the morning sessions, when the exhibition will be open for the purpose of receiving orders from the various firms in the town and district in which the exhibition happens to be at the time, will show a handsome profit for the exhibitors, in comparison with the small outlay incurred. The proposed exhibition will be on the American principle, in which country it has proved very successful, and is for the purpose of fostering South African industries and holding the market we have been fortunate enough to secure up to the present, owing to the absence of overseas competition during the War. The contention is that there are many manufactures in this country known in the town where they are manufactured, but not in the distant towns. Such an exhibition would take the goods round at the minimum of cost and relieve the small local manufacturer of the cost of sending round a commercial traveller. The Exhibition will carry a staff of fully qualified commercial travellers, who will arrive in the towns where it is going to be held about a fortnight before it is opened, and call on firms interested in the things which will be on show. The morning session will be devoted to direct business, that is, people will come and look at the things and order from them. We consider the plan an excellent one, and, in view of the British trades exhibition which is coming to South Africa in May, no time should be lost in carrying into effect the proposed local manufacturers' exhibition, as undoubtedly the British representatives will do their utmost to hustle around and strenuously push their goods against all comers.

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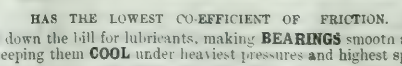

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Notes and News.

Union Steel Corporation.

A full report of the proceedings at the annual meeting of the Union Steel Corporation will be found in this issue. From the speech of the acting chairman, Mr. George Falcke, it will be seen that this Vereeniging enterprise is still forging ahead, and now looks more promising than ever. A notable tribute was paid to Mr. Samuel Marks, who has lately undergone a severe operation, and who, we regret to hear, is not yet out of danger.

* * * *

The Exchange Advisory Committee.

In local Stock Exchange circles the composition of the committee appointed by the Government to advise it in regard to exchange and currency matters is being adversely criticised for including no representative of the stockbrokers, who, next to the mines, probably do a bigger business in sterling with London than any of the interests represented. The various members of the Committee will obviously be placed in a position to judge the trend of affairs, and whether they use this knowledge to the benefit of the interests they represent or not, they will have the opportunity of so doing—an opportunity denied to the stock and sharebroking fraternity.

* * * *

Native Wages to be Increased.

A meeting of representatives of public bodies was held on the 23rd inst., convened by the Secretary for Native Affairs, to consider the question of native wages. The concerns represented were: Native Recruiting Corporation, Johannesburg Town Council, Rand Master Builders' Association, Engineers and Founders' Association, Transvaal Manufacturers' Association, S.A. Society of Motor Traders, and the Johannesburg Chamber of Commerce. The Conference recommended that wages of natives who provide their own food and quarters should be increased, and the Chamber of Commerce recommends that such increase should be at least 25 per cent. on the wages paid previous to the war.

* * * *

Geological Society.

The next monthly meeting of members of the Geological Society of South Africa will be held in the Council Chamber, Chamber of Mines, Johannesburg, on Monday evening, 9th February, 1920, at 8.15 p.m. The following papers will be open for discussion:—"The Geology of the Sabi Valley, Mashonaland," by F. P. Mennell, M.I.M.M.; "Some Notes on the Geology of the North-Western Portion of the Natal Coalfield," by F. A. Steart; "Pleistocene Movements in Sierra Leone," by F. Dixey, M.Sc., &c., Government Geologist, Sierra Leone. The following paper will be read:—"The Karroo Dolerites of South Africa," by A. L. du Toit, D.Sc.

* * * *

A Sidelight from the States.

An interesting sidelight on the exchange question comes to us from a valued correspondent in New York. *Inter alia* he writes: "Of course with the high price of dollars and the low price of pound sterling here, I can easily understand that there can be no business done with South Africa. In the *South African Mining Journal*, I read your quotations on goods and the prices quoted in this market cannot possibly meet them in competition. I do not know where they get the stuff from which they are selling out there as it is from 15 to 25% cheaper than what goods can be landed over from here. The increase in the value of gold will probably enable the Rand to work up more of the low grade mines, but I suppose that the men are also demanding higher wages in these days, which, with the high price of machinery will more than balance the increased value of gold. It seems to me that if the Governments would get together instead of wasting their time about Peace, to decide to make the value of gold or minted gold $100 or $200 for an ounce instead of 20, which is only an arbitrary value, they could thereby make the minted gold of the world from 5 to 20 times its present value, which might in a measure help solve the present difficulties, at least that is my opinion."

Fourteen Years' Rand Accidents.

Lecturing last week on "Safety First," Mr. J. B. Marquard, Inspector of Mines, said in the last fourteen years 360 million tons of rock had been hoisted up the shafts of the Witwatersrand mines. Work in connection with developing, mining, transporting and treating that tonnage had resulted in over 10,600 persons being killed and 22,400 being injured—an army of black and white. There was, however, great improvement. Whereas in 1911, 880 were killed or 4.10 per thousand, the number last year was 472, or 2.43. Falls of rock were the chief cause of mining accidents, and the same improvement was not shown as in other directions. In 1912 27 per cent. of the total deaths were due to falls of rock, in 1918 40, and last year 32.

* * * *

Successful Journalistic Enterprise.

We have been privileged to peruse a circular which is being sent to the Executive Committee of the S.A. Union Farmers' Party to all the members' supporters and friends in which it is announced that the *S.A. Farm News* has been appointed to the proud position of official organ to the party. This young publication has been singularly successful in winning its spurs, for in addition to this very much envied appointment the paper has also been given the position of official organ of the Pretoria Agricultural and Industrial Society. We heartily congratulate those young farmers who have made such a great success of their paper. There have only been four issues of the *S.A. Farm News* so far printed, and during that period the journalistic baby has outstripped many of its elder brothers, and has risen to the top of the tree, and is now in the proud position of being the official organ of the largest association of farmers ever formed in South Africa. We predict a brilliant future for our young contemporary.

* * * *

Tin Output.

The British Empire output of tin is still between 50 and 60 per cent. of the total supply, and the Empire remains one of the chief centres for smelting and refining. In the opinion of Mr. G. M. Davies, writing for the Imperial Institute, the tin supply has been affected by the War less than that of any other metal. The world's total output has risen from 95,000 tons in 1901 to 134,000 tons in 1913, and 122,000 tons in 1916. America has been the chief customer. In July, 1914, the average price was 142½, and in the same month of each of the following years it was respectively 167, 168, 242 and 360. Prices are again soaring, but below a certain point, what with extra charges for labour, supplies and materials, tin production becomes unremunerative. The cardinal difference between Cornish tin mining and the production of the metal abroad is this—that, in Cornwall, shafts have to be sunk to great depths entailing enormous cost in sinking, and continuous cost in keeping the levels dry. With tin mines abroad, the metal is found for the most part at surface, and entails in its production no cost for coal, whilst the labour found on the spot, though far less efficient than that in Cornwall, is infinitively less expensive. It will thus be seen that Cornwall is very severely handicapped by its competitors, and yet, the time was when nearly all the tin produced came from that famous County.

* * * *

Middelburg Steam Coal.

The fourteenth ordinary general meeting of the Middelburg Steam Coal Company was held on December 2 in London, Mr. Alan Cadell, C.S.I., J.P., presiding. *Inter alia*, the chairman said: "The plant and machinery, which had suffered during the floods of 1918 and the recent plague of influenza, have been restored to a state of efficiency, and other additions and improvements will be made as required. The colliery is now equipped for dealing with the full output which it can be called upon by its contract with the Transvaal Coal Owners' Association to supply. The dividend upon the preference shares in the Station Colliery has recently been received, and it is anticipated that a good dividend upon the ordinary shares will be obtained in respect of the current year. The amount of cash in hand has been considerably increased since the date of the report. In comparing the output for the year under review with that of the previous year, we find an increase of 6,864 tons, which would have been much greater had it not been for the influenza epidemic which was so disastrous to our mine. As to the future, we may, I think, look forward with confidence; the output of recent months has been the best on record; two electric coal cutters have been ordered and should be installed shortly, and when these are at work the output should be increased and the costs reduced."

* * * *

Centrifugal Separators.

Discussing the merits of the various machines of the Centrifugal Separators, Ltd., at the annual general meeting of shareholders the other day, the chairman, Mr. J. M. Buckland, said that the position with regard to the alkali machine has scarcely changed. "After the trials of the first separators supplied we received an order for 6 more from the S.A. Alkali, Ltd. The Planetary machine, the "Tin" machine erected at Zaaiplaats is doing excellent work and has been so improved as to be able to deal with 40 tons or more per day. The most important work during the year has been the evolution of the Sugar machine. In July last the machine was installed at the Isizela Mill in Natal, and there it effected the separation of the solid from the fluid constituents of the green mill juice. A further demonstration was carried out under working conditions and has been eminently successful. The problem of the rapid purification of the green sugar mill juice has been solved. The machine has succeeded in separating over 80 per cent. of the solids. We have received from the Isizela Mill an order for our complete battery capable of treating 1,500 gallons of mill juice per hour, equivalent to 20 tons of sugar per day."

* * * *

American Export Credits.

During the week, the cables stated that the U.S.A. Government had decided to leave the arrangement of export credits to private enterprise, and it is noteworthy in this connection that the mail brings news that the Edge Bill to provide the machinery for granting commercial credits in the interests of American export trade, which has been under consideration in the American Senate and Congress for some months has now been passed. The President has signed the Bill, and it is anticipated that no time will be lost before the necessary accommodation will be forthcoming to finance an accelerated movement of American raw materials and manufactured goods to the depleted markets of other countries. The Bill owes its inception to Senator Edge, who was elected to the Senate early this year. He has been Governor of New Jersey and is stated to have been identified with banking and other important institutions. The main feature of the Edge Scheme is the creation of Corporations provided with a capital of not less than two million dollars each, which will take the securities of countries, provinces, cities, corporations, and private and public enterprises in exchange for advances, and secured by these, will issue debentures to be sold to American investors. If these debentures are taken up by the American public, large sums of money will be available for the financing of foreign shipments. Through this service a threefold profit will come to reward the capital and the labour of the United States—first, the direct interest return from the investors; second, the business normally arising from the operation of the concerns by enterprises in which the investment is made; third, the enrichment of the country in which those operations are carried out, so that it is better able to buy, and—what is more important—it is better able to pay its share of the vast sums owed to the United States. In the United States, on the other hand, the scheme will directly benefit labour and capital. During the discussion on the Bill in the House, Senator Edge stated that only by opening such markets is it possible to expect the continuance of trade with countries requiring credit, and further the development of American industry, and to continue the employment of American labour in every line, secure the utilisation of the American Merchant Marine and prevent foreign embargoes against American goods, at the same time stabilising the exchange—which he expects will steady itself automatically.

TOPICS OF THE WEEK.

GOLD, CURRENCY AND THE EXCHANGES

Gold, currency, exchanges and cost of living questions continue to fill the papers and everywhere to provide burning topics of conversation. As briefly as possible, we may review the week's happenings. First, Germany, according to one of its leading bankers, is on the verge of bankruptcy, and he warns the Allied powers that they must combine to help the Central Powers in their own interests. The Allied Powers have called an economic conference to consider the serious situation, but at this meeting America refuses to attend. Instead, Mr. Glass, the U.S.A. Secretary to the Treasury, says his Government refuses to help, and relegates European credit questions to private enterprise. By the passing of the Edge Bill, however, the U.S. Government has made an important move to settle the export credit question in its own and other nations' interests, so that the sweeping declaration by Mr. Glass is not as bad as it looks. Coming nearer home, the Union Government announces the appointment of an Advisory Committee, on which varied interests are represented, and to which its currency problems will be referred. Inflammatory speeches made during the week by local Labourites, and the ballot taken on the mines, which is said largely to favour giving power to the leaders to call a strike for more pay and shorter hours, are symptomatic of the world unrest due to abnormal economic conditions. We still hope it may be possible, however, that the substantial, though doubtless transitory, premium on gold may enable the mines to compromise on these latest demands; and that the low-grade mines particularly may, through obtaining the commodity price of their product, be able to survive the material increases in the cost of labour, stores and machinery. And this brings us to the egregious proposals of our coast friends, led by Mr. Jagger, and the newly-rich produce merchants of Port Elizabeth, to translate the proceeds of the gold premium from the industry of the Rand into their own capacious pockets. That, whether they mean it or not, put bluntly, is to our mind likely to be the net effect of all the talk from the coast about reducing the cost of living by "natural exchange" and convertible note issues. The community is indebted to Mr. Reynolds, the General Manager of the National Bank, for his showing up of Mr. Jagger's specious proposals. Though no doubt actuated primarily by his anxiety to defend the interests of his own institution, Mr. Reynolds' refutation still manifestly renders a service to the whole industry and community. It is impossible to summarise the lengthy and reasoned statement issued by him to the Press during the week—it should be widely studied—but his conclusions strike us as eminently sound and reasonable. Mr. Jagger's remedy for all our economic ills of to-day is a free market in gold, with reservations as regards India and the East; and as a corollary what he terms a "natural exchange." To this Mr. Reynolds rejoins that "no natural exchange can exist between two countries in one of which the currency is based on the gold standard and in the other not. In Britain, the country with which South Africa principally deals, the gold standard has temporarily been abandoned, and therefore there can be no natural exchange between South Africa and London. The exchange Mr. Jagger seeks to establish is one based on the commodity price of gold. Put into practice, he suggests that banks should so adjust their exchange rates that the balance of indebtedness to or by South Africa will be reflected in the ebb and flow of gold." This would mean that leaving out of consideration the bank's margin of profit, the bank rate in South Africa on London would be:—Buying: 35 per cent. discount. Selling: 35 per cent. premium. Mr. Reynolds clearly shows that the effect of Mr. Jagger's exchange proposition, taken in conjunction with the commodity price of gold in the East, would create a disparity between the South African bank note and the sovereign, with the result that the latter would disappear from circulation. Another effect is that the importer would reap the benefit of the exchange, and the exporter would suffer the loss. Further, Mr. Reynolds goes on to show that Mr. Jagger's scheme so far as gold-mining companies are concerned would stultify their participation in the premium now obtainable. It would be absorbed very largely in paying the, say, 35 per cent. exchange for the funds they require on this side. They would thus revert to selling gold on the pre-war price, and there is little doubt that the low-grade mines would have to close down. The whole question, Mr. Reynolds says in conclusion, is "what is best for us to do under the abnormal world conditions. Surely common sense says lock up the sovereigns for the time being so that the drainage cannot go on, and have a secured note issue as currency. Then the legitimate trade of the country can be financed by the banks, which is more than vital for the whole community. Although this country is pleasingly beginning to devolop its many industries still let us frankly admit that the gold mines for the time being are our backbone. Directly or indirectly nearly everyone in South Africa must suffer if you hurt the mines. A great number would be thrown out of employment—coal mines, storekeepers, farmers would all suffer." That, let us hope, effectually disposes of Mr. Jagger and his friends. The hard-won benefit in the shape of the gold premium derived—and only in the nick of time—by the Rand from the patient and persevering efforts of the Gold Producers' Committee in London, headed by Sir Lionel Phillips, has cost too much and means too much to the very existence of the industry to be now surrendered without a struggle.

Another Madagascar Oil Flotation.

The Majunga Oilfields of Madagascar has been floated in London with an authorised capital of £200,000 in £1 shares to take over certain mining permits (principally petroleum), options and agreements, etc., held by Mr. John Martin in the Province of Majunga, Madagascar. The petroliferous area is said to cover an area of about 78 square miles. Mr. Martin, who is the discoverer and vendor, reports very favourably on the property, as is not unnatural, but his report is confirmed and endorsed by Dr. Marloth, Professor Hahn and Dr. Mollwo Perkin. The present issue is of £50,000 of £1 shares at par, and the purchase price is £96,700, payable as to £5,000 in cash on allotment and £25,000, or some less amount, by 31st March next, and the balance in shares. For the general purposes of the company a sum of £20,000 in cash will be available, while the company will have 83,334 shares in hand to issue when required. The area available is big enough to enable subsidiary companies to be formed should development prove satisfactory. Some elaborate expert reports and analyses accompany the prospectus, but no actual work beyond prospecting appears yet to have been done. The venture naturally has possibilities, perhaps large ones, but at the present stage it is, of course, quite speculative.

* * * *

The Excess Profits Duty.

It has been notified that the Excess Profits Duty will cease to have effect from July 10. By the Income Tax Act of 1917 it was decided that "from and after the first day of July, 1917, and for the period of the present war and six months thereafter" there should be charged annually for the benefit of loan account a duty of five shillings in every pound of excess profits received or accrued in favour of any person "during the year ending June 30th, 1917, and during any subsequent period for which the duty is chargeable." For 1918 the duty required no renewal and remained at the same figure, the receipts being earmarked for meeting War expenditure. Last year Mr. Orr decided to double the duty and to transfer the proceeds from loan account to current account. Hence it was provided that all amounts of excess profits duty collected on and after April 1st of last year should be collected for the purposes of ordinary revenue, and the words of the original Act, "for the benefit of loan account towards meeting war expenditure chargeable thereon," ceased to have effect as from April 1st last. The accounting period in respect of which the duty on excess profits is now flowing into the public exchequer terminated on June 30th last, and according to the Treasury estimate the revenue from this source will have totalled £1 350,000 by March 31st, when the financial year ends. The duty will, however, remain in operation in respect of excess profits which are being earned during the new accounting period, that is to say, from July 1st last to June 30th next.

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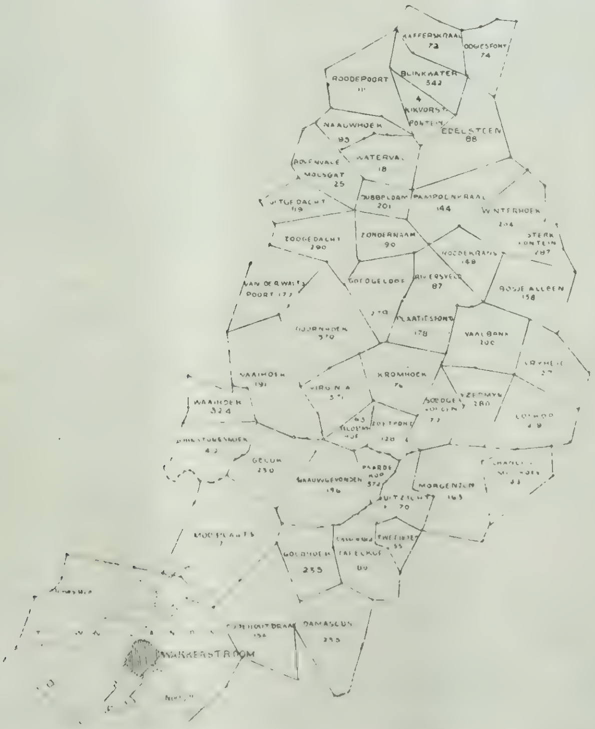
TRANSVAAL OIL SHALES.

The Wakkerstroom Companies Awaiting News from London—An Interesting Map—Many Farms Under Option—The Geluk Company Extends its Area.—Activity in the Ermelo District—Government Apathy Criticised.

INTEREST in regard to the oil shale areas of the south-eastern section of the Transvaal continues to centre principally around the negotiations which have been in progress between the African Oil Corporation and a large and influential English chemico-engineering company. Up to the time of writing no definite news is available as to the progress of negotiations, but there is a general belief that business will result, and of course in this event there will be a great increase of interest in the Wakkerstroom oil shale areas. Meanwhile there is much activity in the district and numerous farms along the bituminous shale belt are under option to various interests.

NUMEROUS FARMS ACQUIRED.

The three floated concerns—African Oil Corporation, Wakkerstroom Oil Company, Ltd., and Geluk Oils, Ltd.—continue to nurse their extensive interests, and a considerable amount of preliminary exploitation work is proceeding along the shale belt. The African Oil Corporation is about to commence boring at the Wakkerstroom oil properties, a manager has just been appointed, and a forward policy of development is to be started.



The Wakkerstroom Oil Shale Fields.

The accompanying map of the heart of the Wakkerstroom bituminous shale area shows the majority of the farms which are in the limelight of present activity and hopes, and it may help to elucidate the position in this area if we enumerate the properties which have already been acquired by the companies mentioned above. These are African Oil Corporation: Virginia 371, Kromhoek 76, Yzermijn 280, and Goedgevonden 77. Wakkerstroom Oil Company, Ltd.: Kirkvorchfontein 4, Naauwhoek 93, Roodepoort 111, Blinkwater 342, Kafferskraal 72. Geluk Oils, Ltd.: Portion (900 morgen) of Geluk 230, 3,000 morgen of Mooiplaats 17.

THE GELUK.

This latter company, which has a capital of £50,000, has recently brought off a very successful deal by acquiring the mineral rights over Mooiplaats, which is only four miles from Wakkerstroom station. The Geluk Oils Company is now in negotiation for further extensive oil share areas. The company is also about to call for tenders for drilling on Geluk and has other important developments in contemplation.

THE ERMELO FIELD.

Interest in Transvaal oil shale areas does not appear to be confined entirely to Wakkerstroom. Several farms reported to be rich in oil contents in the Ermelo district have recently been acquired. Work is now proceeding on at least one of these, and the results are said to be highly satisfactory. There seems indeed to be a good prospect of opening up an extensive and valuable oil shale area in this vicinity in close proximity to the Piet Retief railway line, and we hope in the near future to give further particulars of this field.

Shale Areas and the Government.

The general public await with interest a report from the Government Department of Mines on the extent and value of these new mineral assets of the Transvaal. In other countries the Governments recognise the tremendous industrial importance of oil resources, and in at least one of the British oversea dominions a substantial reward has been offered by Parliament for the discovery of oil fields. From all we can learn the Government of the Union of South Africa are not, however, to be congratulated on any exuberant enthusiasm in regard to the establishment of an oil shale industry in this country. We are informed that not a single official of the Mines Department has as yet found time to visit the Wakkerstroom oil shale areas, despite the activity prevailing in that area and the opinions expressed by leading technical men in regard to the prospects of founding an oil shale industry roughly halfway between the two big centres of Johannesburg and Durban. If this be so, the aloofness of the Government is rather to be deplored, and it is not to be wondered at that one gentleman intimately connected with this embryonic industry remarked to us the other day: "The only interest our Government is likely to take in our properties so far as I can see is the interest they will exhibit if and when we enter the productive stage, when we shall be visited by the official tax gatherers."

PERSONAL.

Mr. J. Reunert, director of the firm of Messrs. Reunert and Lenz, Ltd., leaves on a business trip round the world next week.

* * * *

The firm of Messrs. A. H. Johnson & Co., Ltd., has changed its name to Associated Engineers Co., Ltd. Mr. T. H. Chapman will remain as the Managing Director of the new firm.

* * * *

Mr. A. S. Rome, assistant manager of the Wankie Colliery, and formerly connected with the Bell and Shamva mines, is taking over the management of the Rezende mines, in place of Mr. Blackbeard, who has resigned.

* * * *

Mr. R. Randall Stevens has resigned his position as secretary of the Oceana Consolidated Co., Ltd., and has been nominated to a seat upon the board. Mr. Wallace McDonald has been appointed secretary of the company in place of Mr. R. Randall Stevens.

* * * *

The list of New Year honours contains the name of Mr. Robert Taylor (senior partner of the firm of John Taylor & Sons), upon whom a Knighthood has been conferred. We offer our heartiest congratulations to Sir Robert, and also to the firm, of which he has been the distinguished head since the retirement of Mr. John Taylor, in 1902.

* * * *

Mr. L. B. Wilmot has left the engineering staff of the Corner House since the beginning of the year and is opening offices at 30-31 Oceana Buildings as a consultant in mechanical and electrical work. Mr. Wilmot intends specializing in colliery plants, by-products and all questions appertaining to coal.

The twenty-fifth annual general meeting of members of the Association of Mine Managers of the Transvaal will be held in the Council Chamber, Chamber of Mines, Johannesburg, on Friday, 13th inst., at 3 p.m.

* * * *

We much regret that through an omission the names of the Directors of the Vryheid (Natal) Railway, Coal and Iron Company, Limited, were omitted in the article dealing with the company in the special coal number of this journal. We now rectify this matter by giving the following list of the company's officers:—Vryheid (Natal) Railway, Coal and Iron Co., Ltd. Directors (qualification, £500 in shares or stock): Major G. H. Peake, J.P. (chairman), G. H. Bonas, F. J. Dundas, A. D. Joseph, H. C. Pelly. Consulting Engineers—Colliery, C. E. Rhodes & Son, Rotherham, Yorks.; Iron and Manganese, W. Selkirk, F.G.S., M.Inst.M.M., 3, London Wall Buildings, E.C.2; Mine Manager, I. Hatton; General Manager, J. M. Calderwood, Box 2296, Johannesburg, Transvaal; Secretary and Offices, J. Worton, 5, Fenchurch Street, E.C.3. Telegrams, Vryheidish, London. 'Phone, 1053 Avenue. Cable, Enabol, Durban.

Mr. Hatton's assistant at the mine is Mr. J. S. Wynn. At the Durban office is Mr. W. Bosman.

CORRESPONDENCE AND DISCUSSION.

The British South African Explosives Co., Ltd.

To the Editor, *S.A. Mining and Engineering Journal.*

Sir,—We would draw your attention to a slight error appearing in this week's issue of your journal, under the heading of "Dynamite," on page 486. Nitrate of lead is stated to be £47 per ton, whereas the present price is £57 10s., and we shall be glad if you will kindly correct this in your next issue, so as to remove any misconception on the part of the mines. We also note that you describe this company as "The South African Explosives Co.," which is a mistake, as will be seen from the above heading.—Yours. etc.,

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MELALANE MAGNESITE.

Output Last Year Worth £2,723—The Local Market for Magnesite—A Brief Description of the Deposits.

In the latest return issued by the Mines Department of the Union of South Africa it is to be observed that the output of magnesite for last year had a value of £2,723. The whole of this production was derived from the Barberton district of the Transvaal. In view of the likelihood of a large iron and steel industry being developed in South Africa within the next few years, it will be of interest to give some facts and figures regarding the magnesite deposits of the Eastern Transvaal, since magnesium bricks are largely employed in open hearth furnaces in the steel industry. In the first place it will be of interest to note the outputs of magnesite from the Barberton field during the past few years.

Recent Returns.

The following figures show the value of the product produced in the Transvaal since 1911: 1911, £856; 1912, £1,673; 1913, £1,194; 1914, £1,451; 1915, £1,568; 1916, £1,766; 1917, £2,050; 1918, £2,184; 1919, £2,723. The following notes on the magnesite deposits which have contributed this output have been communicated by a correspondent.

The Mines Described.

The largest occurrences of magnesite in South Africa are situated in the Barberton district of the Transvaal, near Malalane Station, on the main Delagoa Bay line. The mines are favourably situated for easy working on the lower slopes of a range of hills on the south side of the railway, 2½ miles from the siding on a good road. The private siding from which the mineral is consigned is 60 miles from Delagoa Bay and roughly 300 miles from Johannesburg, via Pretoria. The whole of the deposits are at present owned by Mr. E. Budd, who has been developing and exploiting them for the past few years. A practically unlimited supply of the best quality could be obtained but Mr. Budd has contented himself with a monthly output of approximately 100 tons, which he has supplied to local industries. The mineral is exceptionally pure, assaying magnesium carbonate between 92 per cent. and 94 per cent. Picked specimens go as high as 98 per cent., and working costs are estimated at approximately £1 per ton. The principal local consumers are: The Transvaal Carbonic Gas Co., Ltd.; Vereeniging Brick and Tile Co., Ltd., for open hearth magnesium bricks; Kynochs, Ltd., Durban, for magnesium chloride and Epsom salts; Cape Explosives Works, Ltd. These important companies are practically dependent on this mine for supplies, as it is the only deposit being worked in this country. Working conditions are easy, the lodes outcropping on the surface and continuing with great frequency and varying thickness in depth through the serpentine formation.

Sources of Production.

The following table exhibits the world's principal supplies of magnesite (in metric tons):

Year.	Austria-Hungary. (*a*) Crude.	Calcined.	Greece. Crude.	Calcined.	India. (*b*)	Italy (*b*)	United States. (*b*)	Canada. (*b*)
1904	—	53,781	9,133	—	1,193	—	2,585	—
1905	—	92,359	37,063	—	2,645	--	3,568	—
1906	—	87,765	40,584	—	1,861	—	7,093	—
1907	452	113,695	55,816	—	188	—	6,858	—
1908	212	87,049	63,079		7,655	-	5,994	109
1909	341	182,911	18,073	19,182	5,264	-	11,251	299
1910	1,027	125,666	56,797	16,609	199	—	8,588	293
1911	77	182,911	86,956	27,530	3,546	—	8,505	800
1912	—	171,196	106,338	33,848	15,626	—	9,534	1,555
1913	—	200,947	98,517	31,815	16,468	600	8,741	467
1914	—	—	136,701	28,563	1,706	1,410	10,248	325
1915	—	—	159,981	28,563	7,570	9,200	27,669	13,407
1916	—	—	145,533	27,248	17,924	18,252	140,592	50,284
1917	—		162,938	69,837	18,495	31,071	287,433	52,699
1918	—	—	(*c*) 40,000	—	—		225,161	35,711

(*a*) Exports. (*b*) Crude magnesite. (*c*) Estimated

RHODESIAN GOLD AND OTHER DIVIDENDS IN 1919.

The subjoined information is furnished by the British South Africa Company:—The following dividends have been declared by Rhodesian mining companies during the year ended December 31, 1919: Eldorado Banket Gold Mining Co., Ltd. (rate declared or its equivalent), subject to income tax, 7½ per cent., amount absorbed £22,500; Gaika Gold Mining Co., Ltd., 3 per cent., £8,205; Giant Mines of Rhodesia, Ltd., 3·57 per cent., £9,360; Globe and Phoenix Gold Mining Co., Ltd., 56·64 per cent., £113,283; Lonely Reef Gold Mining Co., Ltd., 45 per cent., £121,953. Rezende Mines, Ltd., 50 per cent., £60,000; Rhodesia Chrome Mines, Ltd., 10 per cent., £6,000; Rhodesia Metals Syndicate, Ltd., 5 per cent. on ordinary shares and 25½ on "A" shares, £3,533; Rhodesian and General Asbestos Corporation, Ltd., 10 per cent., £40,000; Shamva Mines, Ltd., 27½ per cent., £165,000; Wankie Colliery Co., Ltd., 5 per cent., £28,367; total, £578,201. The total cash dividends declared by Rhodesian mining companies to December 31, 1919, amount to £6,481,188; this figure does not take into account dividends declared by Rhodesian development and miscellaneous companies in cash or scrip amounting to over £3,250,000, nor dividends paid by local Rhodesian mining companies and syndicates, nor distributions effected in the form of return of capital.

The following dividends also have been declared by Rhodesian development and miscellaneous companies during the year ended December 31, 1919: Bechuanaland Exploration Co., Ltd. (rate declared or its equivalent, subject to income tax), 7½ per cent., amount absorbed, £22,566; Charterland and General Exploration and Finance Co., Ltd., 15 per cent., £24,572; Crescens (Matabele) Mines and Land Co., Ltd., 10 per cent., £7,271; Goldfields Rhodesian Development Co., Ltd., 10 per cent., £125,711; Mashonaland Agency, Ltd., 14 per cent., £20,947; New African Concessions Syndicate, Ltd., 28·07 per cent., £14,037; New Bulawayo Syndicate, Ltd., 7·02 per cent., £8,185; Rhodesia Copper and General Exploration and Finance Co., Ltd., 10 per cent., £17,601; Rhodesia Land Bank, Ltd., 5·61 per cent., £9,824; Rhodesia Railways Trust, Ltd., 4 per cent., £80,231; Tobacco Company of Rhodesia and South Africa, Ltd., 10 per cent., £5,000; total, £330,945.

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SHOULD WE BUY MILLS FROM GERMANY?

Tremendous Cost of Equipment in England and America—The Case of the Modder East—The Problem of the Mark—Germany's Industrial Outlook—Cost of Coal and Steel.

THE tremendously increased cost of erecting a brand new productive equipment on a mine to-day as compared with the cost of installing a like equipment in 1914 is a matter which is greatly exercising the minds of the controllers of the industry and particularly those who direct the fortunes of companies which have reached the productive stage or will reach that stage within the next year or two.

THE CASE OF THE MODDER EAST.

This problem of the cost of equipment bears most particularly on the Modderfontein East. It will be recalled that at the annual meeting of this company held a few weeks ago Mr. Max Honnett took shareholders fully into his confidence and explained that whilst the development position at the mine fully warranted proceeding with the erection of a milling plant of 40,000 tons per month initial capacity, the preliminary estimates of the cost of such an installation revealed an expenditure so colossal that the directors had decided to postpone action in the matter. It will be remembered, too, that at this meeting a shareholder threw out the suggestion that it might be worth the company's while to inquire into the cost of obtaining milling equipment in Germany. Since that meeting nothing has eventuated to suggest that the Modder East Company will be able in the near future to acquire a plant such as it desires in England or in America at a cost which will not tax the full cash resources of the company to the utmost. As a temporary expedient, the company is about to commence crushing at the Apex mill, which it has secured on lease, as was suggested in the columns of this paper several months ago. Meanwhile costs of production have risen, and the latest British and American quotations for all the impedimenta of a stamp battery reveal an almost staggering advance on pre-War costs, an inability to guarantee delivery by any particular date, and in the case of the United States a further great appreciation due to the adverse influence of the exchange.

INDUSTRIAL GERMANY.

In the past Germany has delivered several stamp batteries to this country, and although recent events have not softened our hearts towards the nation which five-and-a-half years ago plunged the world into such suffering and misery, it is each day becoming increasingly evident that only by fostering trade relations with the Central Empires can we save our late enemies and our present debtors from a state of bankruptcy which will render them impotent to discharge their just indemnity obligations. The prospects of purchasing mining machinery urgently required by the mines of the Witwatersrand from Germany would therefore appear to be well worthy of consideration. But would it be advantageous for the Modder East Company to place an order for their battery with a German firm? The question is by no means easy to answer. At first blush it would appear that the greatly depreciated value of German currency would be in our favour as purchasers of German goods. The exchange value of the mark, which in normal times was 20, has recently been fluctuating between 240 and 360 to the English pound. But this does not by any means necessarily imply that we could buy goods in Germany at one-twelfth or one-eighteenth their cost elsewhere. The mark note may yet fall further in value, for it is an unstable factor of currency and seems to bear a purely fictitious value in its paper form in relation to English gold. The unstable rate of exchange is by no means a favourable factor in this connection, and when considered in conjunction with the present industrial situation in the land of the Hun and the dearth of raw material prevailing there, the outlook for purchasing in Germany is hardly encouraging.

THE COAL AND IRON TRADES.

According to latest advices from oversea, British steel makers have at present little to fear, as regards competition. For some time to come, Germany cannot be a serious competitor, particularly in view of her crippled financial condition and the enormous cost to her of all her raw materials. With the metallurgical resources of Alsace Lorraine permanently lost to her, she can, indeed, never compete again on the same scale as before the War. The following notes abstracted from *The Iron and Coal Trades Review* on the German coal, iron and steel industries, have also a marked bearing on the subject of Germany's ability to execute orders in respect of machinery.

"An official contradiction has been issued of a report published in various newspapers alleging that the production of coal in the Ruhr has already reached the level of the former peace-time output. What has led to the circulation of this untrue and misleading statement is the fact that the output of lignite, which has considerably increased during the War, has now attained the peace rate of production and in some cases has exceeded it. The tonnage of coal now being won throughout the country is about two-thirds of that which was obtained before the War, apart from the quantity raised in the Saar, which is under French control. In the Ruhr the monthly production was formerly about 10,000,000 tons, but has only averaged 6,500,000 tons in recent months. In this connection the following official figures have been issued concerning the production of coal and lignite in Prussia in the first nine months of 1919 as compared with the corresponding period in 1918:

	Output first nine months.		No. of miners employed.	
	1919. Tons.	1918. Tons.	1919.	1918.
Coal	81,186,135	120,592,675	648,861	566,102
Lignite ...	55,721,698	65,003,605	99,799	56,958

RISING PRICES.

"The question of prices was again under the consideration of the Westphalian Coal Syndicate at a recent meeting. Since the Ministry for Economy sanctioned the recent increase of 7½ mks. per ton in place of the 20 mks., which was asked for by the Syndicate, further negotiations have taken place between the latter and the Ministry with a view to the grant of a supplementary advance of a large amount. The Syndicate decided to ask for an advance of 35 mks. per ton for coal. This amount includes 12 mks. which had been suggested by the Government in the sense of 10 mks. per ton for the erection of miners' dwellings and 2 mks. per ton for the provision of food for the miners. The difference of 23 mks. per ton is asked for in order to equalise the growth in the pits' costs of production through the increased dearness of materials, particularly pit timber, and to permit of the long deferred opening-up works to be carried out. The increase is intended only to apply to January, as the miners' unions have given notice to terminate on January 31 the agreement which was entered into three months ago, and the higher wages now demanded will involve a further increase in coal prices for February.

"The Economic Committee of the National Assembly has had under consideration a Government proposal to fix maximum prices for iron and steel and establish a fund for the equalisation of the differences between the cost of purchasing foreign iron ore and pig-iron and the costs of production of different works. The Committee, however, adopted a resolution expressing the opinion that instead of official settlements of prices, self-governing organisations should be entrusted with this duty, and suggested that the Government is still considering the question of maximum prices, and that the issue of an Order is impending according to which the State Commissioner in connection with the Steel Federation will be given a right of expropriation of iron and steel products so as to prevent the maximum prices from being exceeded. In the meantime the prices of light sheets have been again increased by the Black Sheet Association by 600 mks. to 3,185 to 3,210 mks. The Association explains that owing to shortage of deliveries by the Steel Syndicate the sheet rolling mills are having to purchase non-syndicated semi-finished steel, the prices of which are considerably higher than those charged by the Syndicate."

Judging from these reports, the industrial outlook in Germany is not so encouraging as some people imagine it to be, and the prospect of securing delivery of machinery from there on a satisfactory basis of exchange will require the closest examination.

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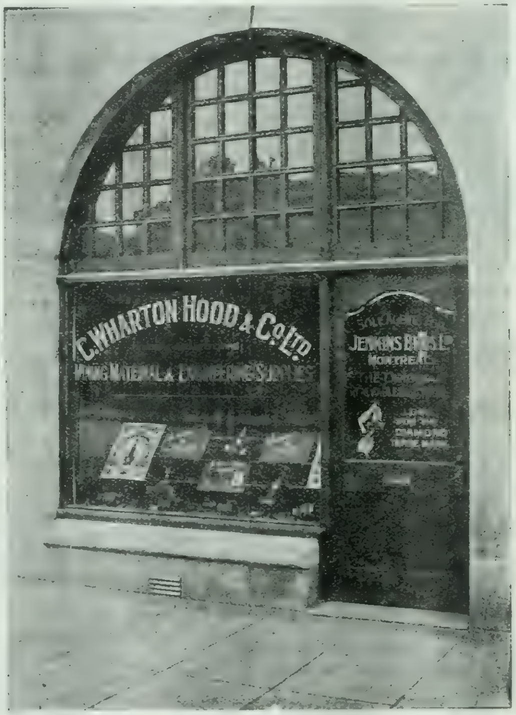
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A NEW ENTERPRISE TO REDUCE LIVING COSTS.

The Rand Co-Operative Stores, Ltd., and its Objects—The Influence of High Prices on the Industry—The Land of Laziness—Post War Fallacies.

Each day as the holocaust of war sinks further into the background of time so each day the terror of high prices seems to increase both in reality and prospect. The world surely never lived in such a fool's paradise as it did during the days of war and fondly imagined that when the great madness was over we should settle down into a snug groove of perfect peace and 1914 prices. What were we not going to do when the War was over? Oh, yes! *Aprés la guerre—Aprés la guerre!* Everything would come down with a run. We should continue to draw war wages but we should buy our meat, our shoes, our clothes and our holidays on the 1913 basis of expenditure. Never was there such a fallacy! That at any rate is the point of view of the man who wouldn't pay £3 for a pair of boots on Armistice Day because he reckoned he'd get them for £2 when Peace was signed, and who now has to pay £4 for the same article.

The Root of the Remedy.

Governments appoint Commissions, wise men suggest various remedies and the public demand prisons for profiteers, but still the pageant of excessive and rising costs marches past the doors of the housekeeper and the portals of industry. In recent issues we have dwelt at some length on the pernicious influence of high costs upon the local industrial situation. When the costs of living rise the worker naturally requires further wages. This is happening all the world over, and higher wages of course result in still higher prices for stores and material. We have shown in recent issues of this journal how greatly the working expenses of Witwatersrand mines have risen in the past four or five years, and we have pointed out that were it not for the premium on gold the condition of the mining industry would be parlous indeed. So far as the inhabitants of the Rand are concerned the root of the remedy is to be sought in their own households. We are, we fear, a notoriously lazy community. There is a tendency in this country always to let somebody else do the real work. Take the eightpenny loaf, for instance. It can easily be demonstrated that the housewife can produce the eightpenny loaf at considerably less cost than eightpence if she cares to do it herself in her own kitchen. Co-operative societies should also do much in eliminating the profiteering element. It may be argued that co-operative societies have never achieved much locally so far, but it is questionable whether they have ever been given a fair trial.

A Noteworthy Enterprise.

In the hurly-burly of present-day problems and difficulties an organisation which promises to assume a large measure of local importance has come into existence with very little notice and without any fanfares of publicity. This is the Rand Co-operative Stores, Ltd., which was registered on November 28th with a preliminary membership of 800 and capital of £800. The avowed object of this praiseworthy institution is to endeavour to reduce the cost of living by co-operative trading. Its early efforts have met with considerable success in the face of large difficulties, and if the concern prospers and grows as its sponsors hope it will, it may and should become a veritable power for good in a land of inflated and continually rising prices.

The Company's Objects.

The objects for which the company has been established are set forth in the memorandum of association as follows:

(*a*) To supply its members and the public generally with goods, and for that purpose to carry on the business of a storekeeper, general dealer, and in particular to buy and sell, manufacture and deal in goods, stores, consumable articles, liquors, chattels, and effects of all kinds, both wholesale and retail, and to transact any kind of agency business, and generally to engage in any business or transactions which may seem to the Company directly or indirectly conducive to its interests.

(*b*) To make arrangements with any persons engaged in any trade, business, or profession, for concessions to the members of the Company or any special rights, privileges and advantages, and particularly in regard to supply of goods.

(*c*) To acquire by purchase, lease, concession, or in any other manner that may be advisable, and to hold any property moveable and immovable, and any rights and privileges and to enter into any contract or agreement which the Company may think necessary or convenient for the purpose of its business.

(*d*) To borrow or raise money for the purposes of the Company, and purpose to mortgage or charge the undertaking, or all or any part of purpose to mortgaged or charge the undertaking, or all or any part of the property of the Company (both present and future).

(*e*) To acquire and undertake the whole, or any part, of the business, property, and liabilities of any person or company carrying on any business which the Company is authorised to carry on, or which such person or company is possessed of, suitable for this Company.

(*f*) To enter into any agreement with any authorities that may seem conducive to the Company's objects, or any of them, and to obtain from such authority any rights, privileges, and concessions which the Company may think desirable to obtain, and to carry out, exercise, and comply with any such arrangements, rights, privileges, and concessions.

(*g*) To promote any company or companies, society or societies, with the object of acquiring all, or any, property and business for the purposes of this Company, and other purposes which may seem, directly or indirectly, calculated to benefit this Company.

(*h*) To lend money or guarantee the payment of money to any person, partnership, or company, to assist such person, partnership, or company to supply goods or materials for the purpose of the Company.

(*i*) To form and establish pension funds for employees and to promote and establish institutions, clubs, or societies, and to erect, lay out, plant, and maintain buildings, grounds, fences, and ornamental gardens with the object of providing pensions for employees, recreation, and means of social intercourse for members of the Company, their families and their relations, and the furnishing of any such institutions, clubs, societies, buildings, or grounds with furniture, fixtures, games, billiard tables, libraries, books, or any other matters or things conducive to the recreation and the social requirements or benefit of members.

(*j*) To engage in any business or undertaking which in the opinion of the company or its directors may be conveniently or advantageously carried on in conjunction with, or incidentally to, the principal objects of the Company.

(*k*) To make from time to time rebates to members on the amounts paid for goods supplied to them by teh Company on the basis of purchases from the Company, and not in proportion to the shares held by them.

Membership.

Membership of the company includes the head office employees of the following organisations: The Central Mining and Investment Corporation, Ltd.; Rand Mines, Ltd.; the Johannesburg Consolidated Investment Co., Ltd.; the Consolidated Gold Fields of South Africa, Ltd.; the Consolidated Mines Selection Co., Ltd.; the General Mining and Finance Corporation, Ltd.; Union Corporation, Ltd.; the Anglo-French Exploration Co., Ltd.; Transvaal Consolidated Land and Exploration Co., Ltd.; the Co-operative Exchange Yard, Ltd.; the Witwatersrand Native Labour Association, Ltd.; the Native Recruiting Corporation, Ltd.; the Transvaal Chamber of Mines; the Rand Mutual Assurance Company, Ltd.; the Witwatersrand Co-operative Smelting Works, Ltd.; the Transvaal Coal Owners' Association (1910), Ltd.; Henderson's Consolidated Corporation, Ltd.; the S.A. Township, Mining and Finance Corporation, Ltd.; Lewis & Marks, Ltd.; L. Ehrlich & Co.; Transvaal and Delagoa Bay Collieries, Ltd.; General Estates, Ltd.; Premier (Transvaal) Diamond Mining Co., Ltd.; J. Dale Lace. But membership may be extended to the employees of such other firms, organisations, or to such individuals as the directors may from time to time decide. Unless with the consent of the directors, no member shall be allowed to take up, or be registered for more than one share of the company, and in any case no one member shall be registered for more than 25 shares.

Directors.

The first directors of the company are as under: Messrs. Herbert Alfred Read, Sidney Cecil Steil, Leonard Sydney Zoe Raymond, Archibald Fletcher Lyall, Frederick William Forbes, Frederick Harold Down, Frank Hall, George William Crawford, and Harry Walter Dalton. It will be seen that the Rand Co-operative Stores, Ltd., has a strong and sound backing of credited business men. The scope of its operations is enormous and we shall look forward with the very keenest interest to the progress of this long-needed movement in our midst.

THE OUTLOOK FOR THE WOLHUTER.

In the course of his annual report on the Wolhuter, the Consulting Engineer, Mr. Percy Cazalet, writes:—The principal features of the results obtained compared with those of the preceding two years are as tabulated below:—

	1916/17.	1917/18.	1918/19.
Tons mined	462,588	418,078	385,781
Per cent. sorted	12·1	8·5	9·5
Tons milled	406,750	382,950	348,920
Recovery—total	£500,456	£456,148	*£431,053
Recovery—per ton	24s. 7d.	23s. 10d.	*24s. 8d.
Expenditure—total	£361,114	£377,273	£385,335
Expenditure—per ton	17s. 9d.	19s. 8d.	22s. 1d.
Total working profit	£139,342	£78,875	*£45,718
Development footage	8,327	6,044	6,319

*Exclusive of gold premium.

The continued decline in the supply of native labour was responsible for the decreased tonnage milled; some of the effect of the lower tonnage was, however, countered by a rise of 10d. per ton in the recovery, the average recovery of 24s. 8d. per ton being satisfactory, as many of the rich Leader blocks worked out during the year and were replaced by ore from reclamation. The decreased profit was due to the continued rise in the cost of labour and stores; white wages showing an increase of 7d. per ton, coloured wages 2d. per ton and stores and materials 1s. 1d. per ton; these increases are due to the higher standard of wages and the continued rise in the cost of supplies. Development has been continued in the south-east portion of the property and is now nearing completion; the percentage of payability of South Reef (namely 75 per cent.) is fairly high, with a value of rather over 6 dwts.; the values exposed on the Leader and Main Reef indicate, however, only a limited payable tonnage; the whole of this area is very considerably faulted. A large amount of work has been done on subsidiary development, opening up blocks where, owing to faulting, the reef has not been fully exposed; this work was very necessary to prove ground of doubtful character, so that no payable ore should be missed; the exposures met with to date have more than compensated for the loss of the otherwise productive labour employed on this rather costly work. The ore mined from block ground amounted to 69 per cent. of the total mined as compared with 85 per cent. in the previous year, the ore reclaimed from old workings increasing over the same period from 11 per cent. to 27 per cent. The ore reserves have been recalculated as at October 31st, 1919, and amounted to the following:—

	Tons.	Value Dwts.	Stoping Width Inches.
Pyritic Quartzite	22,920	6·0	64
Main Reef	165,976	4·7	70
Leader	129,798	7·1	52
South Reef	313,415	5·5	63
Immediately available	632,109	5·7	62
Shaft and boundary pillars	61,785	6·5	54
Total	693,894	5·7	62

The total payable reserves show a decrease of 162,976 tons as compared with the reserves at the end of last financial year, the value over a slightly smaller width being less by 0·1 dwt.; these reductions are due solely to the difference between the ore mined from the payable reserve and the payable ore developed, the pay limit on which calculations have been based remaining the same as for the previous year. In addition to the above payable reserves there is an amount of 105,000 tons of an average value of 4·3 dwts. which also could be included should a 20 per cent. premium on the value of gold be maintained. The supply of native labour, which was very poor for the first quarter of the financial year, improved towards the middle, but declined very rapidly in the latter half, the resulting average being much below that of the previous year; although more than half of the total ore mined is being broken by machines this work is not economical owing to the few available straight-forward stoping faces; as many machines as possible, however, are kept in commission to obtain the maximum output from the labour available and release hammers for reclamation work. During the year an agreement was concluded with the New Goch G.M., Ltd., under which a mutual exchange of ground was effected; the Wolhuter areas exchanged were not of high value and would have become available only towards the end of the life of the mine, whereas those received are of fair grade and immediately accessible. The prospects for the current year depend upon the results obtained from the reclamation of ore in the old workings and from the partially developed blocks which are in process of being proved; stope faces from which a regular tonnage of average grade can be depended upon are decreasing in number and with the increase of tonnage from other sources it will be impossible to prevent fluctuations in grade and profits. Except in the event of a further serious decline in the native labour it may be anticipated that the present scale of operations can be maintained for the next twelve months.

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TRANSVAAL GOLD PRODUCTION IN 1919.

Some Comparisons with 1918—Rising Costs and Decreased Profits—The Gold Premium Spells Salvation—Far East Rand Returns for Six Months.

PUBLICATION of the output analysis sheet issued by the Chamber of Mines for the month of December enables one to contrast the salient features of productive work for 1919 with those of the preceding year.

AN INTERESTING TABLE.

These may best be summarised as under:

TRANSVAAL.

	1918.	1919.
Tons milled	25,267,302	24,412,432
Stamps at work	8,878	8,226
Tube mills at work	338	336
Days milling: Stamps	278·12	281·65
Tubes	292·34	292·25
Yield	£35,768,688	£35,383,974
Fine ozs.	8,420,659	8,330,091
Per ton milled	28/1	28/8
Dwts.	6·60	6·75
Total working costs	£27,318,600	£28,036,079
Per ton	21/8	23/0
Total working profit	£7,678,129	£6,751,595
Total working profit per ton	6/1	5/6
Dividends	£5,273,633	£6,075,765

RISING COSTS.

These figures clearly indicate the incidence of rising costs on the industry. In December working costs on Transvaal gold mines had risen to 25s. 7d. per ton as contrasted with under 22s. last July, and the resultant profit declined from £627,231 to £364,595, or only 3s. 1d. per ton milled during this period. The number of mines working at a loss during December makes it further clear that but for the fortunate incidence of the gold premium the gold mining industry of the Witwatersrand would be in a very serious state. As a matter of fact the gold premium means that the Rand's profit in December was nearly a million and a quarter instead of a mere quarter of a million as announced in the Chamber's analysis sheet, which so far has taken the value of gold at the old standard. As from January, however, outputs and profits will be announced in terms of the premium and accordingly a tremendous amount of interest will be evinced in the returns which are to be announced in the course of the next day or two.

FAR EAST RAND FIGURES.

In the following schedule the salient features of production for the Far East Rand mines for the past six months are given.

BRAKPAN MINES.

1919.	Tons.	Revenue. £	Revenue. s.	Revenue. d.	Cost. s.	Cost. d.	Profit. £	Profit. s.	Profit. d.
July	49,300	93,960	38	1	26	6	27,559	11	2
August	46,700	89,283	38	1	26	5	26,027	11	2
September	41,500	77,755	37	4	28	6	22,139	10	8
October	42,000	75,253	35	8	28	11	18,155	8	8
November	44,000	78,171	35	5	28	1	20,329	9	3
December	44,100	83,370	37	9	30	11	19,338	8	9

GEDULD PROPRIETARY.

1919.	Tons.	Revenue. £	Revenue. s.	Revenue. d.	Cost. s.	Cost. d.	Profit. £	Profit. s.	Profit. d.
July	43,700	65,500	30	0	20	2	21,117	9	8
August	42,800	64,914	30	4	20	8	20,004	9	4
September	42,500	64,523	30	4	20	11	19,680	9	3
October	44,600	67,454	30	3	20	9	20,954	9	5
November	44,200	68,452	30	4	21	2	21,345	9	8
December	43,500	67,734	31	2	22	9	18,019	8	[illegible]

GOVERNMENT AREAS.

1919.	Tons.	Revenue. £	Revenue. s.	Revenue. d.	Cost. s.	Cost. d.	Profit. £	Profit. s.	Profit. d.
July	122,000	212,119	34	9	19	9	91,425	15	0
August	107,000	197,626	35	9	21	9	81,132	15	2
September	113,000	201,742	35	8	21	0	83,210	14	9
October	126,000	217,828	34	7	20	5	89,410	14	2
November	109,000	199,299	36	7	21	10	80,372	14	9
December	103,000	194,593	36	2	23	3	74,617	14	6

MODDER "B."

1919.	Tons.	Revenue. £	Revenue. s.	Revenue. d.	Cost. s.	Cost. d.	Profit. £	Profit. s.	Profit. d.
July	57,000	123,346	43	3	21	3	62,016	21	9
August	53,500	114,714	42	11	22	7	54,020	20	2
September	55,500	117,127	42	2	22	3	54,003	19	6
October	59,000	123,983	42	0	22	3	59,953	20	4
November	50,000	114,706	45	11	24	10	52,028	20	10
December	51,000	102,387	40	2	25	6	39,017	15	4

MODDER DEEP.

1919.	Tons.	Revenue. £	Revenue. s.	Revenue. d.	Cost. s.	Cost. d.	Profit. £	Profit. s.	Profit. d.
July	43,500	95,842	43	11	17	9	56,958	26	2
August	41,300	91,700	44	5	19	2	51,742	25	1
September	42,500	94,920	44	8	18	10	54,645	25	9
October	44,400	98,475	44	4	18	7	57,027	25	8
November	40,700	94,100	46	3	19	8	53,863	26	6
December	41,100	98,186	47	4	21	1	54,789	26	8

NEW KLEINFONTEIN.

1919.	Tons.	Revenue. £	Revenue. s.	Revenue. d.	Cost. s.	Cost. d.	Profit. £	Profit. s.	Profit. d.
July	51,000	69,115	26	9	27	11	*2,848	1	1
August	47,800	70,521	29	6	27	10	3,110	1	4
September	44,740	66,333	29	8	27	10	3,337	1	6
October	51,000	72,641	28	6	27	0	2,991	1	2
November	50,000	66,451	26	7	26	7	539	0	3
December	49,000	64,685	25	7	27	8	*1,620	0	8

* Loss.

NEW MODDERFONTEIN.

1919.	Tons.	Revenue. £	Revenue. s.	Revenue. d.	Cost. s.	Cost. d.	Profit. £	Profit. s.	Profit. d.
July	81,000	174,989	42	2	20	4	90,624	22	4
August	70,000	162,254	46	4	22	3	82,396	23	7
September	67,500	153,568	45	3	22	3	78,390	23	3
October	78,000	172,267	43	10	20	2	90,446	23	2
November	77,000	172,144	44	9	20	4	95,461	24	10
December	75,600	173,091	45	9	22	1	90,583	24	0

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Valparaiso, Chile, South America.

SUB NIGEL.

1919.	Tons.	Revenue. £	s.	d.	Cost. s.	d.	Profit. £	s.	d.
July	11,000	28,511	51	10	38	10	6,775	12	4
August	10,100	27,912	55	3	41	6	6,582	13	0
September	9,900	26,425	53	5	41	8	6,076	12	3
October...	9,700	22,985	47	5	41	9	5,924	12	3
November	8,900	23,910	53	9	42	0	5,014	11	3
December	8,200	22,607	55	2	47	8	4,801	11	9

SPRINGS MINES.

1919.	Tons.	Revenue. £	s.	d.	Cost. s.	d.	Profit. £	s.	d.
July	38,500	66,286	34	1	27	6	13,444	7	0
August...	37,350	65,772	35	3	27	5	14,419	7	9
September	36,550	72,339	39	7	29	1	18,495	10	1
October...	39.600	7,899	38	11	27	11	21,689	10	11
November	36,200	72,025	39	10	28	4	20,606	11	5
December	35,900	67,866	37	7	28	7	16,497	9	2

VAN RYN.

1919.	Tons.	Revenue. £	s.	d.	Cost. s.	d.	Profit. £	s.	d.
July	34,500	34,573	20	0	16	6	5,723	3	4
August...	29,200	32,440	20	10	19	0	4,528	3	1
September	30,700	32,856	21	5	18	8	4,049	2	8
October...	32,100	32,903	20	6	17	10	4,197	2	7
November	31,100	31,926	20	1	18	1	3.716	2	5
December	31,700	31,718	18	11	18	4	2,512	1	7

VAN RYN DEEP.

1919.	Tons.	Revenue. £	s.	d.	Cost. s.	d.	Profit. £	s.	d.
July	48,300	107,990	44	9	21	1	57,179	23	8
August...	47,150	109,838	46	4	22	8	56,523	24	0
September	50,500	110,483	43	9	20	7	58,471	23	2
October...	50,700	113,278	44	8	21	2	59,522	23	6
November	46,500	109.421	47	1	22	11	56,162	24	2
December	47,300	108,164	45	9	22	5	55,007	23	3

An Iron Industry for Rhodesia.

Mr. F. P. Mennell, F.G.S., M.I.M.M., writing in the *Bulawayo Chronicle* on the possibility of an iron industry in that country, after reviewing the ore occurrences, says: "Whatever the situation as regards ore supplies, everything points to the country between the Sabi and Lundi Rivers as the best site for smelting works. Coal is available in large quantities over a wide area; some of this, it is true, is of poor quality, but there is at least one section of the coalfield which has been shown to have excellent coal. It has other advantages in the fact that native labour is abundant and that cattle live and thrive, which is an important consideration as regards conditions of living for white employees. All the northern part of Mashonaland is placed out of the running by the fact that there is no coal between the ore deposits and the sea along any direct railway route. The Sabi area, on the other hand, is about as near the coast as we can get without going outside our territory, and all experience shows that it is better to smelt where the coal is obtained than to bring coal to the iron mines. Even if the ore close at hand proves of inferior quality, it could be economically brought to the smelters even from the furthest off of the deposits that have been mentioned."

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THE MINERAL RESOURCES OF NATAL.—I.

Dr. Hatch's Report Recalled—Low Grade Properties, and How to Treat Them.

[By J. Forsyth Ingram.]

Until about thirty years ago, South Africa was regarded by those of the outside world, who honoured her with even passing attention, as a land of samples—coupled with misfortunes. The serious native and other racial problems that beset the country hampered its progress, and capitalists fought shy of investing their money in ventures that at any time might be damaged or crippled by political difficulties or even by bloodshed. Wars did occur, and decade by decade the difficulties of the past were overcome. From an agricultural and pastoral point of view South Africa has proved her right to be regarded as a land of grand fulfilment; while in respect of the output of diamonds, gold and coal her record will stand comparison with most parts of the older world. The effect of the world-famous discoveries of Kimberley and the Rand was to concentrate the investment of capital to those great centres to the neglect of nearly every outlying part of the sub-continent. Gilt-edged mining ventures only appealed to the investing public, and unless diamonds or gold could be shovelled out by the ton, so to speak, no money was forthcoming for the prospecting of other less promising, but nevertheless valuable, propositions. This sort of thing continued, and still continues in a great measure to the present time. The value of low grade mining properties is now commencing to attract attention, and it is to encourage a close investigation of certain areas that these lines are penned.

A General Impression.

The region to which I would specially direct attention lies to the eastward of the Drakensberg range and comprises the countries known as Swaziland, Zululand, Natal and Pondoland. To get a general impression of the region referred to, one has to take up a position on the crest of the so-called Drakensberg Mountains, anywhere almost between the southern border of Basutoland and, say, the Majuba Mountain in the north, and look eastward towards the sea. From this vantage point the spectator has outspread before him a vast panorama of tumbled mountain, meadow, cliff and stream, which constitutes a view hard to be surpassed anywhere in the country. It was this view that greeted the Voortrekkers after their weary journey across the wide prairies of what is now known as the Free State, and was one calculated to inspire the highest hopes of future prosperity. These hopes have from an agricultural and pastoral point of view been amply fulfilled, but as I have shown the potential mineral wealth which lies hidden under the verdant surface still remains an unknown quantity. True it is that so-called prospectors, many without means and most without any special knowledge or skill, have wandered over the extensive mineralised areas, picking here and picking there, in search of "visible gold" and casting aside much that should have been carefully examined.

Dr. Hatch's Report.

The result is just what might have been expected. Small syndicates were formed by the score, with a few pounds working capital, and in due course, when the second call became due, fell through. Dr. F. H. Hatch, an expert and able engineer and scientist, has published a report on portions of the country referred to, the tenour of which goes to show that the country is highly mineralised, but that for the most part low-grade ores prevail. What is needed now, in these days of low-grade enterprise, is development on business lines. Time was when minerals such as arsenic were passed over with contempt; nowadays it is as eagerly sought after as gold. The same applies to many other items. Before glancing at the detail of the various mineralised districts, it will perhaps be useful to set out something of the geological structure of the regions lying between the Berg and the countries we have referred to. The able report of Dr. Hatch has brought the whole system to a focus, and culling from it we gather, in respect to Natal, that the greater part of the country possesses special claims to attention.

It will be gathered from Dr. Hatch's report that Natal is remarkable for the complexity of its geological structure. This variety in the character of its rocks has an important bearing on the possible mineral wealth of the country. Natal appears to be endowed by Nature with the geological conditions generally associated with the development of mineral wealth. I need not refer in detail to its coal resources, which are enormous, since these are well known, and coal has been excluded from the purview of my report; but the large areas of schist and granite which are exposed over a considerable portion of Natal and Zululand should be the home of many metalliferous deposits such as gold, iron and copper; while the pegmatites that vein the schists near the margin of the granite intrusions are favourable for the occurrence of tin, molybdenite and mica. From Dr. Hatch's report, also, it is seen that all that is needed is a practical prospect of the country by men who know their business. Did space permit, a record of endeavour to win success could be recorded which would read like a romance. Within my own knowledge men who knew nothing at all about mining set out on the golden quest, and striking coal, or plumbago, threw up the work in disgust and went back to their old jobs, poorer but sadder men. I have personally worked on mines in the Tugela Valley, where I have struck ore carrying 40 per cent. of arsenical pyrites with 4 dwts. of gold to the ton in a lode measuring 18 ft. in width. Having developed it as far as my means would allow, I endeavoured to float it, but failed, and more than once I have spent my last penny in trying to interest mining combines, without success. In the Ingubevu Valley I have seen "pockets" of gold running into several hundreds of ounces—but again failed to procure the necessary backing from moneyed companies.

Working Facilities.

With respect to facilities for working: In the first place there are good roads almost everywhere, while water power is abundant. All the big rivers of the Colony take their sources at or near the Drakensberg, at an elevation of some four or five thousand feet above sea level. The Tugela and it tributaries, the Buffalo, Bushman's, Blaukrantz, Sundays and Mooi Rivers, the Umgeni and its tributary the Karkloof, and the Umvoti, may be quoted as examples. Their flow eastwards is marked at intervals by important falls, at which places stations for the development of power in considerable quantities could be easily established and the power applied directly to factory work, or transmitting electricity to more favourably situated sites for industrial utilisation. Other countries that have been similarly favoured by Nature are making great industrial use of their water-power resources: Switzerland, Northern Italy, Germany, the United States of America and Canada may be mentioned as examples that could well be followed by Natal. The treatment of refractory and low-grade ores is now no longer a problem. The history of the Rand proves this. In the past in Natal and Zululand, if a prospect in the pan did not reveal a "tail" halfway round the pan the quest was dropped and the ore carrying a higher percentage of refractory gold than the Main Reef on the Rand was cast aside with a curse. The day has now come when the world needs all it can win in the way of mineral wealth, and it seems monstrous that a highly mineralised region of such wide extent, possessing every facility for working, should lie neglected. It is to be hoped that those who possess the skill and the capital will take up the work and open up a source of wealth that will benefit themselves, the community and the land.

(To be continued.)

MINE EXPLOSIONS DUE TO LIGHTNING.

THE destruction of the headgear of the Blackhill Colliery last week owing to being struck by lightning raises an interesting question. During a snowstorm with thunder recently at Dalton-in-Furness, lightning followed the winding rope down the shaft of a mine and ran along the bottom of the pit for 200 yards. A man at the top of the pit was knocked down unconscious, and a boy temporarily lost the use of his legs. The last report of the Chief Inspector of Mines in India contains an account of a remarkable explosion of fire-damp caused by a discharge of lightning in the new shaft at the Sitalpur coal mine, belonging to the Bengal Coal Company. The explosion occurred during a thunderstorm, and the evidence showed that a flash of lightning had, to all appearances, passed down the shaft, causing disruptive discharges at certain points between the guides and the winding rope, rending the latter at two places situated respectively 228 ft. and 278 ft. from the surface. The distance between the winding rope and the side of the shaft was 5 ft. 4 in., indicating a spark gap of this width, and an intensity of discharge which could not fail to ignite the explosive mixture of gas and air known to be present in the shaft. There is apparently no limit to the vagaries of lightning, and the occurrence, rare as it is, is of interest as indicating possibilities. According to the *Colliery Guardian*, in 1915 Mr. Ferey described in a paper read before the Société de l'Industrie Minérale phenomena similar in character to the above. In a paper, read by Mr. W. A. Douglas Rudge before the Royal Society of London, it was shown that the mere raising of a dust cloud produces a large amount of electricity, the sign of which depends upon the material used. Generally, acid particles become positively and basic principles negatively electrified. Previously, in 1901, Hesehus had shown in Russia that pieces of the same material when rubbed together become electrically charged with the same sign, while the dust abraded in the process receives a charge of an opposite sign. These charges are sufficiently persistent to be measurable with a suitable electroscope. Thus a puff of air containing 5×10^{-9} gr. of dust of mercuric sulphide gave a charge to a collector of several volts; while a centigram of cornflour, blown into a large room, charged the air to an extent which raised the charge on a collector to a potential of 200 volts; and the effect persisted for some time. In the course of the investigation in connection with the Minnie pit inquiry recently concluded, evidence was given as to the behaviour of the roof of the Bullhurst seam, which by rubbing under earth strain in the roof and also by falling upon similar pieces on the floor, developed flares and flashes which seem to differ from ordinary friction sparks, and were referred to by Dr. Wheeler in his evidence as frictional electricity sparks. There is no reason to doubt the evidence of eye-witnesses regarding the character of the sparks seen at the Minnie pit. The length of flame alone seems to preclude the idea of mere frictional sparks, and if in fact they were electrical, a temperature exceeding the ignition temperature of methane might easily be reached. In this connection the *Colliery Guardian* recalls the circumstances of the explosion at the Maindy pit, Glamorganshire, in 1896, where a similar explanation seems to be sufficient to account for the occurrence, as also in the case of the Bellevue explosions, Alberta, occurring at intervals between 1910 and 1911, some of which took place when nobody was in the pit. These were investigated by Mr. J. T. Stirling and Sir John Cadman, and are believed to have been due to sparks produced by falling stones. Experiments showed that the hard siliceous roof gave a brilliant display of sparks on falling, and when struck with a hammer the surface of percussion glowed red hot for an instant, owing probably to the ignition of bituminous matter in the stone. The sparks obtained by friction of one stone upon another could be made to ignite coal gas, a result which has not yet been obtained at the Minnie pit.

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Antelope G.M. Co.

The secretaries of the Antelope Gold Mine (Rhodesia), Ltd., say in a circular that at the meeting in July last, the chairman dealt with the unsatisfactory results, and foreshadowed that operations might be suspended shortly. Since then the situation has not improved, and the directors have felt grave doubts as to operations being continued. The local directors and the engineers, however, recommended that work should be continued for a time. Information has, however, now been received of a serious engine breakdown, causing the complete stoppage of all surface plant. In view of the expenses that would be incurred during the indefinite period that would occur in carrying out repairs, which even when effected might not be permanently satisfactory, and the probability that the remaining ore reserves would not yield sufficient profit to cover the cost of replacing the crank shaft, together with the overhead charges during the time the plant was idle, the local directors and consulting engineer recommend that the mine should be finally shut down, to which the directors have agreed. Instructions have been cabled that no favourable opportunity should be lost of disposing of the plant and buildings and effecting a sale of the property. In the directors' opinion it will be in the best interests of the shareholders for the company to be placed in liquidation forthwith.

Union Tin.

The Acting Secretary of the Union Tin Mines, Ltd., writes: The Managing Director (Mr. Frank T. Richards) returned from an inspection of the company's property on Tuesday night, and I am instructed to state that the plant is now working smoothly, but underground development is retarded by water and shortage of native labour. The output for this month will include 20 tons (approximately) of copper concentrates, already in the bag and partly in transit, and the equivalent of about three and a half tons of 70 per cent. tin concentrates. The tin re-dressing plant has already been reported as too slow to keep pace with the mill, therefore instructions were given to knock off certain milling shifts in order that all concentrating tables can be utilised during such shifts for re-dressing. In view of the advancing values of the metals no definite sales have been concluded.

THE WEEK IN THE SHAREMARKET.

A Sensitive Period—London Buying—Gold Advancing—Strike Negotiations.

A VERY sensitive and at times nervous market has prevailed during the past week. Even the advance in the price of gold to 117s. 6d. per ounce* has failed to buoy up local quotations which are in most instances considerably below London prices. The first monthly group returns which take into account the premium have just been published, and they show what a tremendously beneficial influence the enhanced price of the product exercises on profits. Randfontein Central, for instance, which recorded a loss for December, shows a profit of nearly £40,000 in respect of January operations! Threatened labour troubles, the chaotic state of European finances and restrictions by the Banks on scrip transactions with England have all tended to depress prices, and although London has recently been an extensive buyer, local quotations at the moment of writing are very depressed.

By the time these lines appear in print the result of the strike ballot will be known. It is already a foregone conclusion that the majority of workers have balloted for downing tools, but the gates have not been locked against negotiation, and we believe that a compromise will be arrived at. We understand that Mr. Crawford, General Secretary of the S.A.I.F., has just returned from America, and it is to be hoped that his moderate and conciliatory views will have a favourable influence on the men, who have everything to lose and little to gain by any extremist action.

Gold shares at the moment of writing are stagnant. Modder "splits" have been introduced and are quoted at 82s. 6d., which is the equivalent of £32½ for the old shares. Modder B's are still in the doldrums and "Deeps" are quiet at 52s. Van Ryn Deeps have been a good feature, the price advancing to 102s. This Company's January profit was close on £90,000. Diamond stocks, despite the advance in the price of stones in London, have not been very active. De Beers are better, but Frank Smiths, Crowns and Rouxvilles are a shade easier, and New Elands are notably weaker at 70s.

Tin stocks, despite the high price of the metal are inactive. Oils await news from London in regard to the option granted to an influential overseas firm by the African Oil Corporation. African Farms are no more. This company is now merged in the S.A. Townships, and a Stock Exchange wag has been circulating a funeral card in memory of African Farms which, he says, have "Gone where the good shares go."

	Fri. 30th.	Sat. 31st.	Mon. 2nd.	Tues. 3rd.	Wed. 4th.	Thurs. 5th.
African Farms	15 9	15 9	15 6*	15 6	15 0*	—
Anglo-Amer. Corp..	55 9	55 6	55 9a	53 0*	52 0*	51 0*
Apex Mines	7 6†	7 6†	7 6†	7 6†	7 6†	7 3†
Bantjes Consolidateds.	4 3*	4 6*	4 6*	4 4*	4 0*	4 3*
Brakpan Mines	68 0*	72 0	72 0*	72 6*	72 6*	74 0
Breyten Collieries	—	8 0*	8 0*		12 6†	8 0*
Brick and Potteries	4 6*	4 6*	—	4 6	4 6*	—
British South Africa.	20 0*	—	—	21 0*	21 0*	—
Bushveld Tins	2 3†	1 10*	1 10	2 0†	2 0†	2 0†
Cassel Coals	30 0*	30 0*	30 0*		—	—
Cinderella Cons.	7 0*	7 0	7 6†	7 0†	7 0†	
City and Subs.	7 3*	7 4*	7 0*	7 6	7 9	7 9
City Deeps.	61 6*	62 0*	62 0*	62 6*	62 3*	63 6
Clydesdale Colls.	—	25 0*	—	25 0*	25 0*	24 6*
Con. Investments	33 9*	33 9*	34 3	34 0*	34 0*	34 0*
Con. Langlaagtes	23 0	22 6*	22 0*	23 0*	23 0*	24 6
Con. Main Reefs	14 3	14 9	14 6	14 6	14 3*	14 6
Con. Mines Selection.	32 9	32 6*	32 6*	32 0*	32 0*	31 0*
Coronation Colls.	—	69 6†	70 0†	—	70 0†	67 6†
Coronation Freeholds.	2 3	2 5†	2 3	2 3	2 0	2 0†
Coronation Syndicates.	16 0*	16 0*	—	—	—	12 0*
Crown Diamonds	14 0*	13 9*	14 0†	13 6	13 9	—
Crown Mines	72 0	72 0*	72 6*	72 6	72 6*	75 0
Crown Mines Debs.	—	£97*	£97*	—	£97*	—
Daggafontein Mines	20 3*	20 3*	20 0*	20 0	20 0	20 3
Do. Options (4 yrs.)	1 0	—	0 9	0 6*	0 9†	0 6*
East Rand Coals	2 6*	2 6*	2 6*	[illegible]	2 6*	2 7
East Rand Deeps.	1 2*	1 2*	1 2*	1 2	1 1*	1 1*
East Rand Props.	11 9	11 9	11 6*	11 6	11 4½	11 1*
Eastern Golds	1 8	1 7*	1 7*	1 7	1 7	—
Ferreira Deeps	10 6*	13 0†	7 6*	12 0†	12 6†	10 0*
Frand Smith Dmds.	7 6*	7 9	7 9	7 6*	7 3	7 3
Geduld Props.	54 0	52 6*	54 0	54 0	53 9*	54 0
Govt. Areas	97 9	97 6*	98 3	97 3*	96 9	96 9
Jhb. Bd. of Ex.	35 0*	35 0*	35 0*	35 0*	35 0*	35 0*
Jupiters	5 0*	6 0*	6 0*	5 6*	5 0*	6 6
Klerksdorp Props.	2 1*	2 1*	2 1*	2 1*	2 0*	2 1*
Knight Centrals	6 6*	6 9*	6 8*	6 9*	6 9	6 9*
Knight Deeps.	10 0*	10 0*	10 0*	—	10 0*	12 0†
Lace Props.	17 6*	17 6*	17 6*	—	—	15 0*
Leeuwpoort Tins	30 0	30 0	29 6*	30 9	30 9	30 0*
Lydenburg Farms	7 10*	7 10*	8 0*	7 10	7 10*	7 10
Meyer and Charltons.	—	—	—	97 6	98 0†	—
Middelvlei Estates.	2 4†	2 4†	2 0*	2 0*	2 3†	—
Modder B.'s	153 6	163 6	162 6	162 6	158 6*	158 6*
Modder Deeps.	—	53 6	53 6	52 6	52 3	53 0
Modder Easts	28 7½	28 4½	28 6	28 3	27 10½	27 9
Do. Opts. (3 yrs.)	8 4	8 4	—	8 0*	7 6	7 6
Do. Opts. (4 yrs.)	11 7½	11 7½	11 6	11 4*	11 0	11 1*
Hume Pipes	24 6*	24 6	24 0*	24 6*	23 9*	23 6*
General Minings	—	—	10 0†	10 0†	—	10 0†
Natal Navig. Colls.	26 0*	—	—	26 0*	—	
National Banks	295 0	290 0*	290 0*	292 6	292 6*	295 0†
New Boksburgs	—	—	2 0*	2 0*	—	—
New Eland Diamonds	75 0*	75 0	80 0†	72 6	72 6†	67 6*
New Era Cons.	9 9*	9 6*	10 3	9 9*	—	10 0*
New Geduld Deeps	2 2*	2 2*	2 2*	2 2*	2 3	2 2*
New Heriots.	10 0†	—	—	—	—	—
New Kleinfonteins.	13 6*	13 6*	13 6	13 6	13 3	13 6*
New Modders	£33¼a	£33*	£32½a	—	—	—
New Primrose	3 3*	—	—	—	2 0*	3 11*
New Unifieds	—	6 0†	—	6 0†	—	—
New States	30 0*	30 0	30 6	30 3	30 3	30 3
Nigels	7 6*	7 6*	7 9*	8 0*	—	6 0*
Nourse Mines	14 6*	14 6*	14 6*	14 6*	14 3*	14 6*
Premier Preferreds	—	150 0*	150 0*	—	—	—
Pretoria Cements	95 6	95 6*	97 6	97 0	95 3*	96 0*
Princess Estate	2 6*	2 6	—	2 6*	2 6*	2 6*
Rand Collieries		4 0	3 9	4 0†	—	—
Rouxville	24 6*	24 9	24 9	25 0	25 3	24 6
Rand Nucleus	2 1*	2 1*	2 2	2 1*	2 0*	2 1*
Rand Select. Corp.	105 0	105 6b		102 0*	—	104 0
Randfontein Deeps.	6 6*	7 0*	7 0*	7 6	7 0*	7 1*
Randfontein Estates	25 9	25 6*	26 3	26 3	26 0	26 1½
Robert Victors	18 6	19 0†	18 6	18 6	18 0	17 6
Rooibergs	10 9*	10 6*	10 0*	10 3	10 6*	10 0*
Rodepoort Uniteds.	6 0†	3 0*	6 0†	4 0*	6 0†	—
Rose Deeps	—	—	—	—	—	70 0*
Ryan Nigels	—	4 2†	4 2†	3 9*	3 9	3 9*
Shebas	3 0	3 0†	2 6*	3 0	2 6*	2 6*
Simmer Deeps	3 3*	3 3*	3 0*	3 6†	3 2*	3 2*
S.A. Lands	6 3*	6 3*	6 2	6 4	6 1*	6 1*
Springs Mines	59 6	58 0*	59 0	58 6	58 0	57 [illegible]
Sub Nigels	17 6	17 3*	17 6*	17 3*	17 3*	17 3*
Swaziland Tins	15 0	14 6*	14 0*	14 0*	—	—
South Van Ryns	9 0	8 6*	8 9	8 6*	8 8	8 5*
S.A. Alkali	22 6	24 0	23 0*	23 6*	23 0*	23 0*
Trans. G.M. Estates.	17 0*	17 3*	17 0*	17 0*	17 0	17 0
Tudors	—	—	—	1 3	1 3*	—
Union 5 per. cent.	£104	£104¼	£103	£104¼	£104¼	£104⅞†
Union 4½ per cent.	£102 10*	£102 10*	£102 10†	£102*	£102 10*	£102*
Union 5 per cent.	£102*	£102	£102†	£102¾*	£101	£101*
Union Corporations	—	—	—	22 0*	22 0*	—
Van Ryn Deeps	99 0	99 0	100 0	102 0	101 0	100 6
Village Deeps	16 0†	16 0†	15 6†	16 0†	15 6*	16 0*
Village Main Reefs	—	8 6†	8 0†	7 0*	8 0†	8 0†
Van Dyks	2 9*	2 9*	2 9*	—	2 6*	2 6*
West Rand Cons.	8 0		8 0	8 0	8 0†	—
Western Rand Est	7 6*	8 6	8 0	8 0†	7 6	8 0†
Witwatersrands	18 0*	—	18 0*	19 9†	—	—
Wit. Deeps	10 0*	10 0*	11 3	10 9	10 9	10 9*
Wolhuters	5 3	5 4½	5 6	5 3*	5 3*	5 4½
Victory Monarch	60 0	57 6*	59 6*	57 6	59 0*	59 0*
West Springs	24 6	24 3	24 0	23 6*	23 3	23 0*
Do. Options	7 11*	—	8 0*	7 6*	7 6	7 9†
Zaaplaats Tins	11 6	11 3	11 6	11 3	11 0	11 3

*Buyers. †Sellers. aOdd lots. bEx London.

Lieut.-Col. Llewellyn Andersson has returned to the Rand after several years' absence at the War, during which, it will be remembered, he was wounded and imprisoned in Germany.

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*(As we go to press we learn that gold has advanced still further in price, and the market is firmer.)

THE ASSOCIATION OF CERTIFICATED (S.A.) MECHANICAL AND ELECTRICAL ENGINEERS' ANNUAL MEETING.

Presidential Address—Variety of Matters Dealt With.

A VERY successful annual meeting of the above Association was held on January 31st at the Chamber of Mines. The President (Mr. J. Blythe, Resident Engineer-in-Charge, Robinson Gold Mine), before leaving the chair, said that since he had had the honour of being elected as President, there had been a considerable amount of discussion on the question of payment for services rendered, and this had become a burning question, so much so, that a large amount of time had been spent in discussing the introduction of trades union methods into the Association. Frankly, he did not see what advantages were to be obtained by the adoption of silly militant methods when, if patience was exercised, he believed that the best results could be obtained by negotiation. Recently they had been approached by another association to affiliate with them. What useful purpose was to be served by affiliation? He could not see any! First, they could not recognise that any body of persons who did not possess the Government certificate was competent to be affiliated with, and even if they were, he, for one, would not countenance trade union methods of "striking" nor subject the members of the Association to the operations of the "lock out." If the members anticipated that "trade union" principles should be adopted, then they should, if wise, be prepared to wind up the Association and start afresh as a "trade union." The Association had been doing useful work on the Standardisation Committee and the Trades School. Some recent alterations made by the Provincial Executive had cut out their representation on the Trades School. He was pleased to report that many of their members had served during the War in the regular and in the munitions services. These had all safely returned. The Association had discussed many matters during the year on the question of the training of the youth of the country, and it was generally felt that the limitations laid down by trades unions regarding the proportion of apprentices to tradesmen made it very difficult to apprentice the large number of boys now coming from the schools. Nothing definite had yet been done with another subject, which had been promoted by the Association for the past eight years, viz., the establishment of a special court to try mining cases. For many years they had also urged that engine drivers' training should be specially arranged for, and after many efforts they had brought about a change in the methods of training, which he believed would produce good results for the industry and the country. Mr. Blythe was glad to report that the status of their Association had been improved by the recognition which the Government had given to it, and by the election of certain of the members to seats on the different boards of examiners. The Commission on Low-Grade Mines had met in Johannesburg, but the Association did not offer any evidence, as it was held that the defects in organisation were all in the department of mining. Boards of Reference had been held at the Chamber of Mines, and it was very pleasant to record the fact that when their Association had been called upon, it had been able to render service in dealing with cases coming before those boards. During the year they had been favoured with papers on a large variety of subjects, and he hoped that this very useful work would be extended. In vacating his position he had to thank Messrs. J. H. Wilson, Davidson, and the members of committees for the work they had done, and for the assistance given to him. Mr. Kenneth Austin, the honorary secretary, had given the Association every assistance in promoting the objects for which the Association was founded by him. Mr. Blythe said that there was a clear and distinct line of difference between those few who favour trades union tactics, and those who oppose them, and, therefore, the correct method of procedure of each party was quite clear. The times had changed since 1914, but there appeared to be no reason why the Association should throw away all the accumulated advantages of many years for the doubtful advantages of an unsupported and feeble ideal. Mr. Blythe said that he believed in the kindly spirit of association in work; this ideal might be wrong, but it was his ideal, and the one on which the Association was founded, and the ideal for which he would always stand. When Mr. Blythe took over from his predecessor he stated that the greatest War in history had only just ended: the War based upon bullying, and brutal assumption of force by our foes. The struggles to-day for power in the economic world were much of the same kind, and differed only in degree. He was one of those who believed that the wisest course, the right course, the just course, was to consider every case on its merits, and not to have one dead level standard of conditions. Not only that, but he believed that when the history of the present unsatisfactory labour and social conditions was written, it would be seen that brute force, as exhibited on one side by the "strike," and on the other side by the "lock-out," were both reprehensible, and were productive of nothing but envy, hatred and malice. Mr. Blythe thanked the members for their very large attendance at the meetings. The spirit of the discussions showed that there was every hope for the enlargement of the usefulness of the Association. The membership was increasing satisfactorily. In handing over to his successor he did so with the sure and certain knowledge that so long as the members took as much interest as they had exhibited during the past year, he would have a pleasant time. The honorary secretary had told him that Mr. Innes was the second member of the Association, so that all might be assured that his interest would be continued in the good work started many years back by him and his associates. Mr. Blythe thanked the members for the way that every one had assisted him during his year of office, and he then vacated the chair in favour of Mr. J. D. Innes (Resident Engineer-in-Charge, West Rand Consolidated Mines, Ltd.).

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SCIENCE AND THE MINING PROFESSION.*

The Study of Psychology in Mining.

By Dr. J. S. Haldane, F.R.S., M.A., LL.D.

The War has been teaching us many lessons, but I do not think we have learned them all fully yet. One of these lessons is that by the right application of science to human affairs enormously increased efficiency can be attained. But a second lesson is that the right application of science is by no means the simple thing which it is often supposed to be.

The Medical Aspect of Mining.

Medical Science, or Physiology, is concerned with the working efficiency, health and safety of the men engaged in mining. There is still much misunderstanding on this subject, and the applications of medical science in the details of mining work are to a considerable extent newer than those of the sciences just referred to. Mines have for many years had medical officers, but their function has mainly been an above-ground one in the treatment of mining casualties. The War has shown clearly that the main function of the medical staff of an army is not so much to treat casualties as to keep the army efficient and free from disease. The main function of medical science in relation to mining ought to be in helping to keep men physically fit and to ward off the various dangers incidental to their work. Medical science can help as regards dealing with the gases which may be present in mines; as regards prevention of miners' phthisis, miners' nystagmus, ankglostomiasis, and various other diseases or disablements met with in mining. It can also help in regard to first-aid, which prevents the risk of what may be a trifling cut or other injury developing into something serious, and also prevents more serious accidents from becoming dangerous, and dangerous accidents from becoming fatal.

It was only gradually, and largely through my connection with mining and other industrial work, the work of the Army and Navy, and clinical medicine, that I came to realise the very grave defects in the present academic teaching of human physiology. The current teaching of physiologists has been for the last fifty years, and still is, that the living body is nothing but a very delicate piece of machinery which, like any other machine, cannot look after itself apart from intelligent guidance. As a matter of fact the living body is constantly adapting itself to varying conditions. It is not a machine at all, but a living organism. The conception of it as a machine has tended to stifle medicine and surgery as curative arts, and to sterilise the applications of Medical Science to industrial work.

Psychology.

Under this heading the Lecturer continued: There is general agreement that of all the capacities required by anyone occupying a responsible position in mining, or other industries, the capacity for understanding and getting on with fellow-men, so that their confidence and respect are ensured, is the most important. A man may be a prodigy of technical, scientific and financial knowledge, but if he is weak in his practical psychology he has to take rather a back seat in an industry like mining. He might do well in, say, a laboratory by himself; but mines contain men, and not merely chemicals and what is called by the repulsive name "Labour"—as if men were nothing more than electric power or compressed air. What is called "Capital" means also men. It is men who are the deciding factor in all matters relating to mining, and who does not understand them will never understand mining. There are no examinations in the subject. It is not even a subject for the Mine Manager's Certificate, though it is the main thing which decides whether the holder of a Certificate will ever become an actual manager. Nor is it ostensibly taught in schools or colleges; but if it is not learnt either there or at home, or somewhere, it has to be learnt afterwards by bitter experience.

By Psychology I mean the capacity for seeing other men's interests and standpoints—their good points as well as their weak points—and meeting them fairly and squarely in the light of this knowledge, in such a manner as at least to earn their respect. Perhaps one could best describe it as ordinary Christian charity. The mining profession needs faith, hope and charity, but the greatest of them is charity; and to the honour of British mining, charity abounds more down pits in this country than it does on surface. There is a subtle influence about a pit, and I have always that instinctive feeling when underground of being among good men and true. But charity is an empty thing without the practical skill in which it expresses itself. It is the combination which makes a good miner.

In the mining profession a man must be an all-round man, a whole man. He must know enough about mathematics, physics, geology, medical science, and, above all, what I have called psychology. But if he guides his actions too much on any one of these branches of knowledge exclusively he will not succeed, though perhaps he may sometimes make money for himself and others. He may, for instance, concentrate too much on the purely financial aspects of mining. If he does so without knowing the other sides of mining, or always taking really competent advice on the subject, he is little better than a gambler. The data on which he bases his financial calculations will probably be totally unsound, however excellent his arithmetic may be. If to take another, but I fear less common, extreme he concentrates too much on the health, safety and material welfare of those under his direction he may fail on the financial side and bring his enterprise to decay. Or else he may find that his people are so fed-up with health, safety and material welfare that they can stand it no longer and prefer to go where they have a more free and interesting life.

The Help of Professional Specialists.

A mining man has so many different things which he must think about that he seldom has the time needed for going very far into pure science. Hence in solving many problems of his work it seems to me that he ought to call in the help of professional specialists. But it is no use to have a specialist unless the special problem he is required for is explained to him sufficiently. He is a specialist and not a mining engineer, and would only make himself ridiculous if he assumed a responsibility which belongs to others. The mining man must have a sufficient knowledge of science to enable him to judge of the need for special scientific investigation; and the scientific specialist, on the other hand, must have the wit to see what is required, and if possible carry the investigation to a point of usefulness considerably beyond what could have been predicted. When a man with a love for and genius for scientific investigation is brought into contact with new facts and experiences there is no saying how far he may be led forward.

To bring science to bear more effectually on mining and other industries we need two things. The first is that the responsible heads of the industry should have a sufficient general knowledge of science to enable them to see the points at which more science is required. As regards this, we are suffering from grave disabilities. The second is that capable and properly-trained professional scientific men should be brought in to take up investigation at these points. In this country there has not hitherto been a sufficient demand for the serious services of science in industry, and as a natural result there is a quite inadequate supply of capable men fit for the work.

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*Abstract of an address delivered before the Past and Present Mining Students' Association at the Wigan Mining and Technical College, at the opening meeting of the session.

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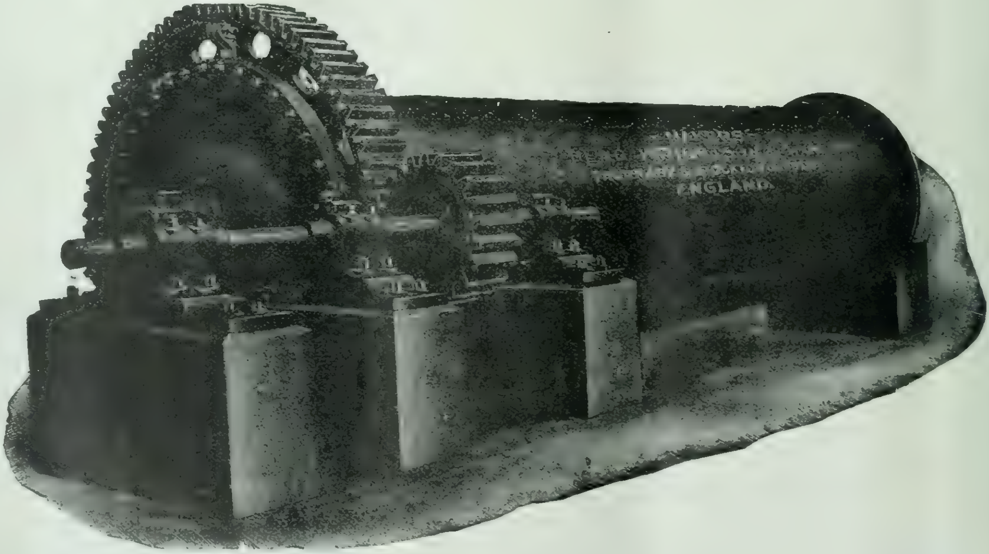

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ENGINEERING SECTION.

A TECHNICAL DIGEST.

Abstracts from Latest Oversea Exchanges of Interest to Mining, Metallurgical, Mechanical and Electrical Engineers.

FERRO-CONCRETE IN MINES.

The Iron and Coal Trades Review of December 26, 1919, contains an abstract of a paper read by Mr. T. J. Gueritte on "Applications of Ferro-Concrete to Mines" on December 18, before the Midland Institute of Mining, Civil and Mechanical Engineers. The author is Ingénieur des Arts et Manufactures (Paris); President of the British Section of the Société des Ingénieurs Civils de France; Vice-President of the Society of Engineers (Incorporated)); and Councillor of the French Board of Trade. In the course of his paper the author stated:

Ferro-concrete has been used for the construction of efficient stoppings in the cross-cuts between main air passage-ways, the advantage found being that they may be built at a reasonable cost. They entail no maintenance cost, are incombustible, unaffected by water, and have a high bearing strength to assist in supporting the roof. Concrete-block stoppings have been used in several cases. They were already an improvement on the old style of stoppings, but were occasionally destroyed by a near-by, windy, or blown-out shot, or a general mine explosion. Ferro-concrete, owing to its reinforcement, is able to stand uninjured in most cases of explosion, and is therefore to be preferred.

Ferro-concreae is used also in shaft-sinking. An example which has aroused a great deal of interest is that of the Coventry Colliery, Keresley, carried out in 1914 under the direction of Mr. Albert François. This enabled him to deal most successfully with the abnormal outbreaks of water met with in the course of the work. Work commenced in No. 1 shaft, at a depth of 490 ft. The operations in the first place consisted of the construction of a ferro-concrete plug 20 ft. thick in the shaft-bottom, during the construction of which the existing feeders of water were pumped by means of sinking pumps. After successfully closing off these feeders by cementation with the aid of the above-mentioned plug, treatment of the water-bearing ground below was proceeded with, the extensive fissures encountered were satisfactorily treated, and sinking was commenced in March, 1915. Since that date the shaft has proceeded steadily down to a depth of 1,100 ft., the cementation process having been employed during the whole time in five successive lengths of treatment. The shaft has been lined entirely with ferro-concrete, by means of which any water remaining in the strata sunk through after treatment has been successfully closed off, and a perfectly dry shaft obtained. The minimum thickness of the ferro-concrete walling which has been employed is 18 in., and the pressure of water closed off corresponds approximately to the static head from the surface. A speed of 20 yards a month was attained.

As is well known, concrete blocks for shaft linings have been used in a few instances. Ferro-concrete has been suggested as an improvement, as it would permit of reducing considerably the thickness of the casing, and consequently the diameter of the excavation, by 2 or 3 ft., or even more, which is an important consideration. This application, however, has not as yet stood the test of time.

A NEW ELECTRIC WINDING ENGINE.

The Electrical Review of December 26, 1919, describes a new winding plant of a modern type, which—though not claimed to be original, is unique in the county of Northumberland—was recently put to work at the Cowpen Coal Co.'s Isabella colliery. The winding engine is operated and controlled on the Ward-Leonard system, the electrical energy being supplied by the Northern Counties Electricity Supply Co., Ltd., being 3-phase, 40 cycles per second, and at a pressure of 2,750 volts between phases. The engine is required to raise ultimately 150 tons per hour, and at present 120 tons per hour from a vertical depth of 900 ft., the weight of the cages and ropes being balanced. There is one decking level, and decking is done without the assistance of mechanical appliances.

A DRILL-ROUND MODEL.

This is described in the *Mining and Scientific Press*, San Francisco, of December 31, by Walter S. Weeks. This is an apparatus by means of which the placing of drill-holes may be studied accurately. Light wooden frames are covered with chicken-wire, through which wooden rods may be placed at any angle.

ANOTHER SOURCE OF SULPHUR.

For some time there have been occasional suggestions, more or less practical (says the *Canadian Mining Journal* of December 17, 1919), for the utilisation of the vast amount of sulphur dioxide which is annually wasted in connection with the use of the sulphide ores of Ontario. A method of utilisation of this gas which gives every promise of success is reported to be in operation in connection with the Tacoma Smelter in Washington. The sulphur dioxide is liquified and since in this condition it is quite readily separated from air and other gases it can be placed in suitable containers and shipped to sulphite mills within reasonable distance.

THE WORKING OF COAL-CUTTERS.

"The Difficulties met with in the Working of Coal-Cutters," formed the title of a useful paper, read by Mr. W. Carson (Newbattle Collieries, Newton Grange), at a meeting of the Scottish Branch of the National Association of Colliery Managers, held at Heriot Watt College, Edinburgh, on November 28 (says the *Iron and Coal Trades Review* of December 26, 1919).

Remarking on the fact that there had been so many papers about coal-cutters and conveyors, the author said that it was with diffidence that one again approached the subject. He had therefore left out the more controversial points which had always been dealt with in previous papers, such as roof-control, suitability of conditions, comparisons between conveyors, etc., and had taken up some of the minor points in connection with the working of conveyors which, although seldom taken notice of, were just as essential to the successful working of the system.

Referring to operations at the colliery with which he is connected, the author said that before introducing conveyors they had been working longwall by the ordinary method of driving a main road and branching places off every 14 yards. To make a suitable face, eight of these places were straightened up and the conveyor put in. To overcome the doubt of the workmen as to the safety of the face, they had to continue the brushing of the roads for some time until they gained confidence.

"The introduction of the iron prop and steel strap," the author continued, "allowed us to cut out all the roads with the exception of two, the main road at the one end and the return at the other. As the method of using the props has been dealt with in a paper read before the Branch some time ago, there is no necessity for me to describe it. Suffice it to say that they have turned out to be a great success, and have enabled us to overcome the difficulties in connection with the control of the roof."

ENGINEERING SCIENCE IN 1919.

The Engineer, in its annual review (January 2, 1920), states of the development of engineering science during last year: "In the realm of pure science an event of great moment terminated the year. A few years ago Einstein, working on the principles of relativity, expressed the opinion that rays of light would be drawn towards the sun by twice the amount explainable by Newtonian gravitational attraction. An opportunity for checking this view was presented by the eclipse of the sun in May, and later in the year it was announced at the Royal Society that measurement of the photographic plates showed, as Einstein had foretold, that the rays of light from certain stars were in their passage close to the disc of the sun deflected one and three-quarter seconds of arc instead of about three-quarters. The confirmation was held to upset the whole theory of the æther, and physicists asserted that it overthrew all our hypotheses based on the existence of that useful medium."

PRECISE LEVELLING.

The *Colliery Guardian* of January, 1920, contains an abstract of a paper read before the Institution of Civil Engineers by Major E. O. Henrici, R.E., on precise levelling. The paper contains an investigation into the causes of errors in levelling operations, an account of the methods adopted to minimise them, and an estimate of their magnitudes. Tables are given showing how far the actual discrepancies obtained agree with those to be expected from the estimated effect of the various individual errors considered. The chief conclusions arrived at are: (1) The design of the standard levelling instruments as used in this country for many years can be considerably improved, not only for precise work, but for all work. The instrument used in the work discussed in the paper, is one designed by Dr. Wild (formerly of the Swiss Survey), and made by Messrs. Zeiss, of Jena. The author is glad to say that firms in this country are now producing instruments embodying the good points of the Zeiss instrument. (2) The chief cause of error in the levelling as now carried out is due to the movements of the supports of the levelling staves during the time they are "holding the height" between the forward and back readings to the staff.

Rand Water Board: Tenders for Spare Parts.

The Rand Water Board has accepted the following tenders for spare parts for pumps: Spares for the Weise & Monski pump (to be manufactured locally by the East Rand Engineering Co.), £710 10s.; Mather & Platt pumps (imported from the manufacturers), £144 10s.; Glenfield & Kennedy pumps (manufactured locally by the Phoenix Foundry), £54 10s.

Barnato Group.

The results of operations of the Barnato group for January are as follows:—

Mine.	Stamps.	Tons Crushed.	Revenue from Gold
Consolidated Langlaagte ...	100	43,500	£63,977
Government Areas	180	111,000	240,848
Langlaagte Estate	200	35,650	50,916
New Primrose	100	17,000	19,098
New Unified	60	11,000	15,699
Randfontein Central	600	145,000	217,191
Van Ryn Deep	90	51,400	143,122
Witwatersrand	215	31,200	45,473
Totals and averages ...	1545	445,750	£796,324
December totals	1545	407,620	£606,678

Mine.	Total Working Costs.	Working Costs per Ton Milled. Shillings.	Gross Profit including Sundry Revenue.
Consolidated Langlaagte ...	£47,113	21·661	£17,047
Government Areas	121,091	21·818	120,332
Langlaagte Estate, ...	42,589	23,893	8,495
New Primrose	16,472	19·379	2,700
New Unified	10,862	19·749	4,868
Randfontein Central	178,150	24·572	39,914
Van Ryn Deep	56,926	22·150	87,138
Witwatersrand	36,928	23·672	10,073
Totals and averages ..	£510,131	22·888	£290,567
December totals ...	£482,220	23·660	£129,204

Note.—Revenue derived from gold for month of January calculated at the rate of £5 7s. 6d. per fine ounce.

Modder East.

The report of the Modder East directors for the quarter ending 31st December, 1919, states that the following are particulars of the development footage accomplished in No. 1 shaft section, together with reef disclosures for the quarter ended 31st December, 1919: Totals and averages: Footage advanced, 3,745 ft.; footage sampled on reef, 2,330 ft.; reef width, 23 inches; reef value, 11·1 dwts. Of the quarter's development footage on reef, the payable portion of 1,185 feet or 50·9 per cent. averaged 13·9 dwts. over 26 inches or 362 inch-dwts., whilst of the development on reef to date the payable portion of 8,797 feet, or 52 per cent., has averaged 22·4 dwts. over 21 inches, or 470 inch-dwts. No. 2 shaft section: Totals and averages: Footage advanced, 1,121 ft.; footage sampled on reef, 1,010 ft.; reef width, 25 inches; reef value, 14·3 dwts. Of the quarter's development footage on reef, the payable portion of 820 ft., or 81·2 per cent., averaged 13·9 dwts. over 29 inches, or 403 inch-dwts., whilst of the development on reef to date the payable portion of 1,310 ft., or 87·3 per cent., has averaged 16·0 dwts. over 27 inches, or 432 inch-dwts. No. 3 shaft section: Totals and averages: Footage advanced, 1,418 ft.; footage sampled on reef, 1,110 ft.; reef width, 20 inches; reef value, 14·0 dwts. Of the quarter's development footage on reef, the payable portion of 690 ft., or 62·2 per cent., averaged 14·6 dwts. over 23 inches, or 336 inch-dwts., whilst of the development on reef to date the payable portion of 2,410 feet, or 70·8 per cent., has averaged 15·4 dwts. over 25 inches, or 385 inch-dwts. The following summarises the work for the quarter: No. 1 shaft: Percentage payable, 50·9; payable footage, 1,185; average width, 26 inches; average value, 13·9 dwts.; inch-dwts., 362. No. 2 shaft: Percentage payable, 81·2; payable footage, 820; average width, 29 inches; average value 13·9 dwts.; inch-dwts., 403. No. 3 shaft: Percentage payable, 62·2; payable footage, 690; average width, 23 inches; average value, 14·6 dwts.; inch-dwts., 336. Totals and averages: Percentage payable, 60·6; payable footage, 2,695; average width, 26 inches; average value, 14·1 dwts.; inch-dwts., 367. Similarly, the results to date are shown by the following:—No. 1 shaft: Percentage payable, 52·0; payable footage, 8,797; average width, 21 inches; average value, 22·4 dwts.; inch-dwts., 470. No. 2 shaft: Percentage payable, 87·3; payable footage, 1,310; average width, 27 inches; average value, 16·0 dwts.; inch-dwts., 432. No. 3 shaft: Percentage payable, 70·8; payable footage, 2,410; average width, 25 inches; average value, 15·4 dwts.; inch-dwts., 385. Totals and averages: Percentage payable, 57·4; payable footage, 12,517; average width, 22 inches; average value, 20·4 dwts.; inch-dwts., 449. The total footage of development work for the quarter was 6,284 feet. The average number of whites employed was 185 and of natives 1,090. Work in connection with the Apex milling programme, which was fully described at the third ordinary general meeting, held on the 9th December, 1919, was taken in hand and good progress is anticipated for the current quarter; unless unforeseen circumstances arise milling on a modest scale should commence early in April. The expenditure for the quarter amounted to £94,515, made up as follows: Development, £67,364; machinery and plant, £14,797; interest on debentures, etc., £2,211; general expenses, including head office, £10,209; total, £94,581; less No. 2 shaft sinking and equipment, £66; total, £94,515.

TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Business Erratic—Mines still very Economical—Bank of England and its Gold—Oils and Colours—The Markets and Cost of Living—Iron, Steel and Machinery—Timber and Building Materials—American Trade.

Business is somewhat erratic. For example, the mines are purchasing very economically; as one broker remarked, if they wanted twenty-nine bars of iron they would not requisition for thirty. A group buyer also said that the strike question was overhanging everything like activity from the mines, for although he was not aware of any special restricting instructions from headquarters, yet the feeling amongst managers and storekeepers was there just the same. Perhaps the American exchange, and in fact all financial exchanges had a great deal to do with the uncertainty, which has created a certain measure of anxiety especially in dealing freely in commercial commodities. A visit was made to two of the banks, where it was ascertained that one could send £4,000, as a transfer of funds from Johannesburg to London, and receive an eighth per cent. premium. That, however, was not exactly the point, but rather as to how Johannesburg was faring as regards oversea trading, which brought up the question of scrip drafts. The manager replied that the change was £1 1-16 per cent. for sending scrip to London, and then only to a very limited extent. The special meeting of bank managers and other financial experts, called by the Government, to be held in Pretoria this week, is being looked to for bringing more light upon such a complex problem. The British Chancellor of the Exchequer will also have a meeting this week with the bankers in reference to London's financial position. America suggests that the European governments should lift the embargoes on gold in order to bring about a rectification of the exchange. A leading banker in London says with the present heavy adverse balance of immediate indebtedness, this could not be done without a serious risk of the loss of all our gold. It appears that the banks at Port Elizabeth have notified clients that letters of credit granted to agents up-country will not be honoured, thus putting a damper on speculation.

The Bank of England and Gold.

Before the Great War the exchanges by the increase and decrease of the Bank of England rate of discount were worked to a wonderful nicety, but, alas! since then everything has been upset simply because America sold so freely of foodstuffs and ammunition and so collected a superabundance of gold. As regards the manipulation of gold in London, the Act of 1844 provides that all persons shall be entitled to demand from the Issue Department Bank of England notes in exchange for gold bullion at the rate of £3 17s. 9d. per ounce of standard gold, the person tendering the same to be at the expense of melting and assaying it. The holder of the gold is not bound to go to the bank, however. The coinage of gold being quite gratuitous in England, therefore, he may, if he so pleases, deliver it direct to the Master of the Mint, who will in due time return it in the shape of sovereigns, at the rate of 1,869 sovereigns for every 480 ounces metal of standard fineness, 11-12 pure gold and 1-12 alloy, equivalent to a price of £3 17s. 10½d. per oz. This is known as the Mint price of gold and is 1½d. per oz. higher than the Bank price. But it is as a matter of business better to deal with the Bank, as one can get payment at once by allowing 1½d. per oz. Before the War, if an exporter wished to make a shipment of gold to a foreign country, it might not have suited his purpose to send sovereigns, and in that case he asked the Bank to give him bar gold, as being more convenient for export and in fact formed an international currency, travelling backwards and forwards as a sort of make weight to balance the differences of international indebtedness.

Oils and Colours.

Stocks are easier, as good shipments have arrived and others are on the way. All landed prices are from 7½ to 12½ per cent. higher, but that is a secondary consideration in these times, as the stock has of late been urgently wanted. According to the British representatives, they are not particularly looking for orders as all the factories are more than full up with Home and Continental orders. The demands are enormous and great efforts are being made to keep up supplies and so retain the pre-War business. The position of the best brushware is acute, as the lily white bristles are not obtainable from Russia, and until business again really starts with that country we shall have to be content with black bristles from China. The following are extracts from a February trade circular. Market report: White lead: Three increases in price have been cabled during the past month. Price now in England is 80s. We quote to-day 105s. per 100 lbs. Linseed oil: Price remains firm in England. We do not see any hope of decrease in price for some time to come. We quote to-day: 14s. per 7 lb. tin; 70s. per 4 Imp. gall., St. Paul's brand (genuine English). Turpentine: Price has reached the highest point in history. Turpentine could not be landed to-day under 160s. per case. We quote genuine turpentine: 16s. 6d. per tin, 5-6th Imp. gall.; 160s. per case, 10 tins; 150s. per case, 2-4 Imp. galls. Turpentine substitute, 8s. 6d. per gall tin. Red oxide in oils, 90s. per 100 lbs.; dry ditto, 16s. per 100 lbs. Putty, 7½d. per lb. in bulk and 9d. in bladders. Colours in oil, 1s. 3d.—1s. 9d. per lb. ordinary, but specials up to

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The Markets and Cost of Living.

The property market is quieter, but prices are excellent for up-to-date small and medium residences. Thanks to the rains the forage market is gradually easing and the farmers are pushing business to catch the present good values ruling. On Tuesday the forage section was occupied to its utmost capacity and the business transacted was almost a record for quantity and certainly the record for the total value passing through the Market Master's hands. Best forage realised from 13s. 6d. to 14s. 3d., being 2s. below the recent top values; medium, 11s. 6d. to 12s. 3d. Good lucerne was firm at 13s. 6d. to 14s.; mixed, 11s. to 11s. 6d. per 100 lbs. Best chaff was 5s.; teff, 11s. to 11s. 6d., and 8s. 6d. to 9s. 6d. medium; veld hay, 1s. 6d. bale; bedding, 8d. to 9d. Mealies were steady at 32s. 6d. to 33s. per 200 lbs. Kaffir corn, 37s. 6d. Wheaten bran, 18s.; and maize ditto, 11s. 3d. At the opening beans were easier by 5s. per bag, but soon recovered, closing only 1s. 6d. down, good whites and sugars being 60s. to 64s. The demand for potatoes was good, best 25s. to 27s. No. 1, and 21s. to 22s. for seconds. Prices of fruits and vegetables were easier and the glut of tomatoes continues. One of the things that do not go easier is butter, as the prices realised were from 3s. to 4s. per lb., the latter being an almost unheard of price. The best fresh eggs were 2s. to 2s. 1d., and new laids from 3s. to 4s. 3d. per doz. According to a meeting at Capetown, the Minister came to the conclusion: "That South Africa with wheat in hand, together with the new crop and importations from the Argentine in sight, had a sufficient wheat supply to last till June and July. That the Government was also doing its best to get wheat and flour from Australia. If the Government got flour the benefit of any reduction in price must go to the consumer. The Premier of Australia promised to send 20,000 tons of flour with the South African Government ship, "The Huntress," as a favour, as he stated that owing to the short harvest in Australia there was no spare wheat after meeting the millers' requirements. The price of household flour in Johannesburg is from 39s. to 40s. per 100 lbs. Altogether we seem running along the top of the high prices for produce and foodstuffs, as the Government is taking a lively interest in the very pressing cost of living problem and the rains seem likely to continue.

London, January 30.—The following were the cash and forward delivery closing quotations on the London Metal Exchange to-day: Standard copper, £119 and £120 15s.; electrolytic copper, £122 10s. and £124 10s.; Straits tin, £383 5s. and £383 10s.; lead, £47 5s. and £47 15s. Bar silver closed at 84⅛d. per ounce, and gold at 117s. per ounce.

Iron, Steel and Machinery.

Business is quieter, although for bar iron and steel the demand is fair. It is said that Vereeniging mild steel is likely to be advanced if not already done. The imported mild is 35s. 6d.; tool steel, 1s. 6d.; drill steel, 7½d.; brass rods, 2s. 3d.; plates, 2s. 6d.; copper plates, 2s. 6d.; flat galvanised iron, 60s.; bar iron, 35s. to 40s.; second-hand tram rails, 12 to 16 lbs., £22 10s.; cocoa pans, £15 to £20 each; good steel plates, £30; girders and channels, £30; cast-iron scrap, £7 10s. to £8; gun metal, 8d. per lb. Pipes, 4 in., 2s. 9d. to 3s. 6d. per ft.; 6 in., 5s. to 6s. per ft. Loco-type boilers and small engines, as well as road engines, are almost unobtainable, and poor hopes are entertained as to replenishment. Fencing wire is 42s. 6d. per 100 lbs.;

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wire netting, 6 x 2, by 2 in. mesh, 52s. 6d. for 50 yards. There is a great demand for barbed wire for fencing purposes throughout the Transvaal. Stocks are scarce and dear, being 52s. 6d. per 100 lbs. No. 12 gauge.

Timber and Building Materials.

Baltic timber is not too plentiful, although some yards have more than others because of arrivals from the coast. The price of deals is 1s. 9½d. to 2s., according to quality and length. Floorings, 9½d. to 10d.; ceilings, 6½d. to 7½d. South African timber is being more and more used, as the demand for all timbers is greater than the supply. Rhodesian timber is improving both in quality and in the sawing; the price is the same to-day as it was when the agency in Johannesburg was opened two years ago, although the railway rate has increased 25 per cent., which represents about 3d. a cube. Rhodesian teak, 8s. 9d. a cube; Mukwa, 6s.; mahogany, 10s. 6d.; Portuguese mahogany, 8s.; East Griqualand bastard yellow wood, 6s. 9d. The deals cut from this wood, 3 x 9, are 1s. 1d. per ft.; the shelving, 12 x 1, 9d. A question was raised as to the seasoning of these goods, and the reply came that they had a certain amount of seasoning from the forest to the yards; then there was the cutting and the railway carriage, and with our weather the wood after, say, six months from the cutting to the selling proved as a rule all sufficient. From a cursory glance at the orders, it was surprising what a number of orders have been given by the Municipalities and mines, as well as the Government and furniture people, with the greatest demand from the Natal manufacturers at present.

Second-hand Yards.

Owing to the scarcity of mining material and all kinds of power machinery, many of the yards are getting very bare of material. This also applies to the building material yards. One or two yards are known to have shut down, not on account of no business doing, but simply because they really could not keep up anything like an ordinary stock; and now that the poorer-grade mines have a new lease of life through the gold premium, there is no chance of getting second-hand material from that quarter. As regards pioneer houses, the rents now obtainable are so good that all the ordinary landlords get what they can for rents and trust in Providence for the future.

The American Trade.

One would have thought that there would have been a great decrease of ships coming from New York to the Cape, but such is not the case, as from inquiries it was found that seven steamers are booked for that route during the month of February. These vessels are bringing baking powder, vaseline, pickles, sauces, and such like groceries, also quantities of soft goods and clothing, and motor cars in galore. However, there is not much mining material or steel goods. The representative giving us this information said that they could do three or four times more business if it were not for the extraordinary American exchange, but he said that the English manufacturers cannot supply many of the essentials required. One cable just to hand said in reference to an order that it could not be supplied before 1921, and naturally people cannot wait so long for many things required at once. America in some things is not much better than England for guarantees as to deliveries. In some things the exchange should not stand in the way of the orders, as the thing of paramount importance is to get the American manufactures that cannot be obtained elsewhere.

Victory Diamonds.

A telegram has been received indicating that the crusher, pump and engine recently despatched to the mine have been received in good order and an engineer has been sent down to supervise the erection. It is expected that the machinery will be erected and the plant running in about a month's time.

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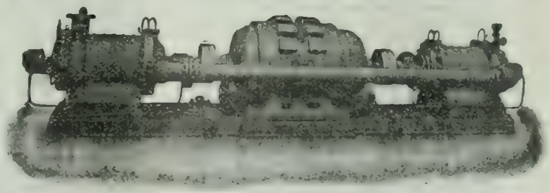

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Company Meetings.

WITBANK COLLIERIES.

Sir Evelyn Wallers presided at the annual meeting of the Witbank Colliery Jan. 21, and in moving the adoption of the report of the directors and the accounts, said: The tonnage despatched from [illegible] shows a decrease of nearly 40,000 tons, although the total time worked was equivalent to 17 more days for both pits than for the previous year. This is largely due to the influenza epidemic in the latter months of 1918, since, although operations were not completely suspended at either pit, the effective labour force was seriously reduced during the epidemic, and the efficiency was below normal for a considerable period thereafter. Loss of time through shortage of railway trucks was again a pronounced feature. There were spasmodic improvements in this respect, but unfortunately no general improvement is as yet apparent. At the last annual meeting we referred to the proposed construction of a storage bunker, which, it was hoped, would assist in minimising the effect of broken working time. Owing to difficulties in obtaining materials, the erection of this bunker has been somewhat delayed, but it is now, I am glad to say, nearing completion. We have also in hand the installation of another large compressor and additional boilers to meet the increased requirements of our coal cutting appliances in view of the extension of the workings, and the necessity of operating more districts to maintain the output under the reduction of working hours. Ventilation in the Witbank pit has been greatly improved by the installation of a large Sirocco fan, at the most southerly air shaft of this mine. During the year under review, eight semi-detached houses for the use of our employes have been built, as well as cottages for the medical officer and the surveyor. These are all now occupied, and the housing position has thereby been somewhat relieved. No doubt, it will be found advisable to erect further houses from time to time, as we must certainly see to it that our employes have healthy and comfortable accommodation so far as lies in our power. In addition to the matters already mentioned, the Board has authorised expenditure on sundry other items of improvements, among which the most important are:—A commodious change house for white employes; more rondavels for the native location; and a large increase in the number of mine trucks to handle the output under the reduced working hours.

You will have seen that the profit for the year was £86,261, a drop of £13,110. This amount, added to the unappropriated balance carried forward from the previous year, makes a total of £188,325, for which we have to account. We expended in equipment £12,154, on Government taxes £7,284, and on two dividends of 15 per cent. each £63,000, or in all £82,438. We thus carry forward to the current year a slightly increased unappropriated balance of £105,887, represented by cash and cash assets, less liabilities, the net cash amounting to £50,031. The proposed increase of capital forms the subject of a special general meeting to be held at the conclusion of this meeting. The tar plant has been in operation for some months, and investigations are being carried on to dettrmine the possibilities of the tar and its derivatives.

The motion for the adoption of the report and accounts was carried unanimously.

Mr. M. Honnet and Sir Abe Bailey, the retiring directors, were re-elected.

THE UNION STEEL CORPORATION

The eighth ordinary meeting of shareholders of this corporation was held in the Board-room, Lewis and Marks' Buildings, Johannesburg, on Friday, the 30th January, 1920. Mr. George Falcke presided. Amongst those present were Major Aubrey Butler, Messrs. O. T. Greener (managing director), L. Marks, C. B. Kingston, R. W. Townsend (representing the African and European Investment Company, Limited), W. L. Penny and H. J. Dowdall, representing personally and by proxy 121,643 shares of a total issue of 229,562. The meeting being declared duly constituted. Mr. D. McGregor Kay (secretary) read the notice convening the meeting and auditors' report.

The Chairman addressed the meeting as follows:—I have to express deep regret that Senator Samuel Marks is not with us to-day, the more so that his absence is occasioned by serious indisposition. Senator Marks' many activities are so well known that I need hardly remind you that for the past 40 years and more he has taken the keenest and most active interest in the agricultural and industrial development of this country—in particular, the creation of a South African iron and steel industry was ever one of the projects nearest to his heart. I have not the least hesitation in saying that this country owes more than it can realise to his energy and initiative. I am sure I express your sentiments when I say, "May he soon be restored to his wonted health and vigour." I have much pleasure in welcoming here to-day our colleague, Major Aubrey Butler, son of the late Mr. Isaac Butler, who came out here in 1913, at a time when the success of our enterprise looked very doubtful, and rendered great assistance, and who by his technical knowledge and by demonstrating his confidence in the business by investing a considerable sum of money in it, very largely helped to save the situation. I also welcome his friend, Mr. Reese, one of the foremost experts on modern blast furnace practice both in Europe and America. Both these gentlemen have come over from England at considerable personal inconvenience—but most opportunely in the interests of your corporation—to investigate the position and give us the great benefit of their advice and assistance in considering the advisability of erecting blast furnaces for the production of pig-iron from local ores on a modern commercial scale. The report and accounts having been circulated, I presume that you will take them as read. The information contained in these is so full and clear that I propose merely to touch upon a few points of interest arising therefrom. You will see that the net profit for the year which is carried to the balance sheet, after making full provision for depreciation on machinery and plant, buildings, dwelling-houses, etc., writing off premium on debentures redeemed, writing down investments and creating a reserve against certain contingencies, is £57,780 4s. 1d. Adding to this figure the balance brought forward from last year, £40,568 15s. 9d., we have a total credit balance to profit and loss account of £98,348 19s. 10d. This amount is reduced by £18,154 12s. 10d., representing accrued dividend to 30th September, 1919, on the 8 per cent. cumulative participating preference shares, leaving a credit balance of £80,194 7s., against which, however, there is a contingent liabiliity in respect of excess profits tax and income tax, the assessments on your company in this respect not having yet been made. Turning to the balance sheet, you will note that during the year the issue of 8 per cent. cumulative participating preference shares has been increased by 42,500 shares. This is due to the guarantors of loans advanced to the company in the difficult days of 1916 having, with one exception, all exercised their options. By this issue your directors were enabled to redeem the debentures issued and to pay the premium thereon. At the date of the balance sheet one bond of £25 remained unredeemed, having been lost. Reserve for depreciation on machinery and plant, buildings and dwelling-houses now stands at the sound figure of £45,145. On the asset side of the account the item "Machinery, Plant and Buildings" shows an increase of £19,426 16s. 10d., representing considerable extensions to our property. In order to provide better accommodation for our employes, £6,364 9s. 3d. has been expended during the year on stands and dwelling-houses. As stated, accrued dividend on the 8 per cent. cumulative participating preference shares to 30th September, 1919, amounting to £18,154 12s. 10d., was paid out during the year, but no further distribution of profits to which the holders of these shares are entitled under the articles of association was made. It has been the policy of your directors, who are themselves the largest shareholders, first and foremost to place the corporation's affairs on a thoroughly sound financial basis, and I feel sure you will agree from the accounts presented to you to-day that this policy has been successful. It is felt that the position now disclosed fully warrants the further distribution of part of the profits earned, and that not only the holders of the 8 per cent. preference shares, but also the holders of the 7 per cent. preferred ordinary shares should participate therein. I have pleasure in announcing that since the close of the financial year a sum of £25,000 has been appropriated for this purpose. After satisfying the prior claims of the 8 per cent. cumulative participating preference shares in terms of the articles of association, there will remain sufficient to enable us to start paying off the arrears of dividend due on the 7 per cent. preferred ordinary shares, and payment on account of accrued dividend on these shares in respect of the years 1912 and 1913 will be made at an early date. As you are aware, the industrial development of this country is receiving the closest attention of the Government and industrialists both here and abroad. The iron and steel industry is unquestionably one of the most important industries contributing towards the progress and welfare of any new country, and merits all possible support and assistance from the Government. The Prime Minister, General Smuts, in his speech at Harrismith on January 27th, referred to the future of the iron and steel industry in this country, and it is apparent that the Government is alive to the fact that such an industry is essential to the welfare of the Union. Your directors are equally alive to the possibilities of such a scheme, and are closely watching the shareholders' interests in this regard. It is very opportune that at this juncture we should have the great benefit of the active assistance on this side of Major

Butler and Mr. Reese, with their invaluable experience. At this critical stage of our development we feel that we are entitled to look for reasonable assistance from the Government of this country. We claim that we have established an industry which has proved of inestimable value during the war, when products manufactured by us were most difficult to obtain. We were of the greatest possible assistance to the various mining industries of the country, in the success of which this country is so deeply involved. We have done much in training young Afrikanders and in finding employment for them, and, needless to say, every expansion means further employment. I have no hesitation in saying that we look forward hopefully to receiving in the future every consideration from the Government. During the war period many industries have sprung up in the country. A large impetus has been given to agriculture by reason of the increased exports of farm produce, wool, meat, etc. Every district in the Union is clamouring for railway facilities. Expansion is evident in every direction. We are told by our leading statesmen, especially those who have visited Europe within recent years, that large numbers of better-class emigrants are waiting an opportunity to come and settle in South Africa. The influx of an energetic type of immigrant is bound to influence progress in this country. In the immediate future new gold mines will be opened in the Far East Rand. The working of base metals and minerals is receiving constantly increasing attention. Within recent years distant parts of the continent of Africa have become accustomed to draw their requirements as far as possible from the Union. I mention all these facts because they are bound to have a great effect upon the demand for the products of your corporation, and to show that there is plenty of room for the expansion of our activities. In conclusion, gentlemen, I think that you are to be congratulated on the result of the year's working and the strong financial position in which the corporation finds itself to-day. It has been a year of industrial turmoil throughout the world, the extent and results of which it has been impossible to foresee. I might add that our present favourable position has not been attained without a considerable amount of anxiety to your directors and management. Our thanks are due to our managing director, Mr. O. T. Greener, for the successful manner in which he has again supervised the operations. We have to thank our London committee and secretary for the unremitting attention they have given to the affairs of the corporation in the United Kingdom, and also our sales manager, Mr. L. H. Lavenstein, as well as the secretary and office and works staffs. I now beg to move: "That the report of the directors, together with the statement of accounts to 30th September, 1919, duly audited, be approved and adopted."

Major Aubrey Butler (director) seconded.

The Chairman then invited questions on the report and accounts, and, there being none, the motion was put to the meeting and carried.

The retiring directors, Messrs. James Patchett and George Falcke, were re elected, and Messrs. Deloitte, Plender, Griffith, Annan and Co. reappointed auditors, and their remuneration fixed at 200 guineas.

The proceedings terminated with a vote of thanks to the chairman.

AFRICAN LIFE.

The fifteenth annual general meeting of the members and shareholders of the African Life Assurance Society, Limited, was held in the Board-room of the society, African Life Building, yesterday, when there were present, among others, Messrs. I. W. Schlesinger (in the chair), R. Bowman, Francis Napier, W. O. Bullock, I. F. Atterbury, J. A. MacRae, D. M. Burton, H. J. Hill, M. Abrahams, F. T. Fowles, W. J. Geerling, A. Fuller-Jones, general manager, and F. C. Ford, secretary.

The chairman, in moving the adoption of the directors' report and balance sheet, said: The directors are pleased to submit for your approval their report bearing upon the operations of the society's fifteenth financial year. The revenue accounts of both departments and the composite balance sheet are given in the usual form. Casual reference to these documents before you is sufficient to show that from whatever point of view our results for the year 1919 are examined, they undoubtedly far outstrip anything previously presented. These remarks apply with equal force to both departments, for it will be observed that both exhibit a big increase in premium income; substantial increase in interest earned, and a most gratifying increase in assets.

New Business.

The number of applications received in the ordinary department during the year was 10,761 to assure £3,623,225. Of these 1,819 for the sum of £357,800 were declined, postponed or not proceeded with, leaving 8,942 completed, and policies issued totalling £3,265,425. In the industrial department 71,922 policies were issued, assuring £1,711,958 18s. 4d. The new business results of both departments, taken together, show that for the year under review the society issued 80,864 policies, representing assurance amounting to £4,977,383, an increase over last year's results of 1904 in the number of policies issued and £914,283 in amount of assurance effected. It is a somewhat remarkable fact that comparatively few men or women of their own free will apply for life assurance. They almost invariably await to be asked; consequently life insurance companies find it imperative to employ agents and officials whose duty it is to go into the highways and byways preaching the gospel of insurance. That those men have worked strenuously goes without saying, and the figures I have just quoted speak more eloquently than words and visualise in a simple manner the unrivalled popularity of the African Life that it is really all that its most eloquent eulogists represent it to be. The procuration of the new business—as will be gathered from the preceding remarks—must necessarily be comparatively a costly affair, and in view of the huge increase in assurance effected, an increase in expenses might reasonably have been anticipated. I am glad to say, however, that notwithstanding the large volume of new business written, the new business expenses in the ordinary department work out at 86.63 per cent. as against 89.95 per cent. the previous year a reduction in expense of 3.32 per cent. —which I consider very satisfactory indeed

In the Industrial Department the reduction in the expense ratio is even more striking Nothwithstanding the higher level of remuneration of the society's representatives owing to the increased cost of living a reduction of expense was effected, amounting to 17 per cent. as compared with the figures of last year.

Income.

From the revenue accounts you will observe the total income amounted to over half a million sterling, made up as follows:—

1. (Ordinary Department) renewal premiums, £251,371 11s. 5d.; 2, premiums, £135,029 13s. 2d.; 3, interest, rent, etc., £44,758 17s. 11d.; 4. (Industrial Department), premiums, £140,806 16s. 5d.; 5 interest etc., £1,651 18s. 1d.—£573,619 12s. 0.

With regard to item number (1) renewal premiums, this exhibits an increase over the previous year of £51,000 odd, and goes to show that the class of new business written by the society is not of a fleeting character and is surely further evidence of the confidence which our members repose in us. Item number (2) represents new premiums in the ordinary department. Year after year for some years past this society has been able to claim records in new business premium income. The figure £135,029 13s. 2d. appearing in our accounts this year is no exception to the rule. It is far and away the highest total ever collected in South Africa by any assurance company in respect of new life insurance business. It exceeds the previous record by £41,733 12s. 7d, an achievement which only those conversant with the difficulties incidental to the business can fully appreciate. Item number (3), interest, rent, etc., £44,759 12s. 11d. represents a ratio of £5 18s. 4d. per cent on the mean assurance fund, a rate of interest considerably in excess of that assumed for valuation purposes and obviously a potent source of strength to the society.

Industrial Department.

Not many words are required to show that this department has really made wonderful strides. We find that the total premiums collected in the industrial department during the year amount to £140,806 16s. 5d, a figure which represents an increase of £33,000 odd compared with last year. These figures are really phenomenal for so young an institution as the industrial department of this society, which actually came into being as recently as April, 1915—four years and nine months—and in order to show these results in their true perspective I may state that our industrial premium income to-day far exceeds the combined industrial premium income of all other companies operating in South Africa. This, gentlemen, is a record of which we are justly proud, and exemplifies in a high degree the diligence, intelligence and pluck of our superintendents and agents throughout the land.

One gratifying feature on the expenditure side of the revenue accounts, which I may mention, is that payments on account of death claims are £98,391 less than last year.

The total funds appearing in the balance sheet stand at £967,378 19s. 5d., an increase for the year of £242,243 0s. 5d. At the end of the year the total assets stood at £989,561 18s. 1d. and to-day you will no doubt be happy to know our assets exceed one million sterling; thus in the comparatively short space of 15

Investments.

With regard to investments of the society, which are clearly stated in the balance sheet under the respective headings, it will be observed they are entirely South African, consisting of Government and municipal stock, municipal loans, Union 5 per cent. Stock and first mortgage loans all gilt edged securities. This, of course, is in accord with the policy laid down at the inception of the society and in accordance with the trust deed—that no investments be made in shares of any description, second mortgage bonds or speculative ventures of any kind whatsoever.

In conclusion, I would like to say that the year under review completes our third quinquennium, and at the present time our actuary is preparing a valuation of the affairs of your society. From the figures before him he assures me that the position of the society is impregnable, and that a substantial surplus will be disclosed.

Before I sit down I wish to tender to our head office and branch office staffs and field force our heartfelt thanks for their valuable services during the year.

Dr. Francis Napier seconded the adoption of the report and balance sheet, which were unanimously adopted.

There being no further nominations, the retiring directors, Messrs. William Otis Bullock and Isom Fuller Atterbury, were re-elected, and the appointment of Messrs. D. M. Burton, J. A. McRae and H. J. Hill as directors was confirmed.

The retiring auditors, Messrs. Deloitte, Plender, Griffiths, Annan and Company, were re-elected, and their remuneration for the past year fixed at 750 guineas.

S.A. Railways and Harbours.

IMPORTANT NEW WORKS AUTHORISED DURING OCT., 1919.

Cape Main Line: Regrading of line at 206½ miles.
Cape Main Line: Regrading of line from 176½ miles to 176¾ miles.
Worcester: Improvements to station and yard.
Kalk Bay: Improvements to station.
Osplaats: Erection of new house for foreman.
Letjesbosch: Erection of new house for foreman.
Klipbank: Erection of new house for foreman.
Three Sisters: Erection of new house for foreman.
Vleifontein: Erection of new house for foreman.
Tunnel Siding: Erection of new house for foreman.
Dwyka: Erection of new house for foreman.
Baviaans: Erection of new house for foreman.
Kraaifontein: Erection of new house for stationmaster.
St. James: Erection of new house for stationmaster, Kalk Bay.
Hutchinson: Erection of five new houses.
Cape Flats Line: Lengthening of low level.
Cape Flats Line: Platforms at seven stations on the line.
Potfontein: Improvements to watering facilities.
Touws River: Equipment of the running shed.
Salt River: Provision of a store for jigs and shop drawings at workshops.
Salt River: Provision of three overhead electric travelling cranes for steel underframes and boiler shops.
Salt River: Raising the roof of underframe shop.
Table Bay Harbour: Provision of one dipper dredge and one hopper barge.
Paauwpan: Erection of new house for foreman.
Spytfontein: Erection of new house for foreman.
Dronfield: Erection of new house for foreman.
Content: Erection of new house for foreman.
Pudimoe: Erection of new house for foreman.
Warrenton: Erection of a 50,000 gallon concrete tank for water supply.
Kimberley: Equipment of the running shed.
Klerksdorp-Fourteen Streams Line: Provision of a station at Camelford and a new loop at 254 miles.
Uniondale Road: Erection of new house for stationmaster and conversion of present quarters into station offices.
Uitenhage: Provide and instal new machinery at workshops.
Port Elizabeth: Construction of south breakwater.
Elliot: Erection of new house for stationmaster and conversion of present quarters into station offices.
Queenstown: Erection of four new houses for running staff.
Bloemfontein: Provide and instal new machinery for the running shed.
Bethlehem: Provide and instal new machinery for the running shed.
Valsch River: Improvements to the watering facilities.
Fouriesberg: Improvements to the watering facilities.
Wonderkop: Raising of the dam wall by 4 feet.
Krantz Kloof: Erection of new house for foreman.
Gillitts: Erection of new house for foreman.
Jacobs: Erection of new house for stationmaster.
Besters: Erection of two new houses.
Reavitree: Provision of new signalling installation.
Natal Main Line: Relaying between 220 miles 71 chains and 224 miles 71 chains.
Durban: Provision of a new native compound at Point.
Braamfontein: Increased siding facilities at Show Ground.
South-Eastern Line: Additions and improvements to gangers' cottages.
Booysens: Instal electric light.
Welverdiend: Provision of an overhead footbridge and island platform.
Randfontein: Provision of an overhead footbridge and island platform
Zeerust: Provision of a reinforced concrete reservoir of 100,000 gallons capacity.
Nelspruit Gra-kop Line: Re-sleepering of 5½ miles of track.
Waterval Boven: Erection of two new houses.
Potgietersrust: Improvements to the watering facilities.
Klerksdorp: Equipment of the running shed.

IMPORTANT NEW WORKS AUTHORISED DURING NOV., 1919.

Leeuwbosch Halt: Provide for flood waters at Klipspruit Bridge.
Pieters: Opening as a fully-equipped station.
Capetown: Lengthening platforms Nos. 9, 10 and 13; provide additional sidings and signals.
Cape Western Main Line: Provision of native quarters at gangers' cottages Nos. 29, 30, 58 and 61.
Beaufort West: Drainage of the railway camp.
Salt River: Extension of tube shop.
Salt River: Erection of new springsmith's shop.
Port Elizabeth-Uitenhage: Provision of telephone line between Port Elizabeth and Uitenhage, and provide an exchange at Uitenhage.
Kroonstad: Erection of seven new houses for staff.
Sydenham: Erection of fourteen new houses for staff.
Viljoensdrift: Erectino of one new house for staff.
Vierfontein: Erection of house for stationmaster.
Bloemfontein: Erection of fourteen new houses.
Virginia: Erection of one new house for foreman.
Greenlands: Erection of one new house for foreman.
Bethlehem: Erection of six new houses.
Patentie: Erection of two new houses.
Springfontein: Improvements to watering facilities.
Glen: Improvements to watering facilities.
Mossel Bay Harbour: Provision of two wooden lighters.
East London: Purchase of 22 additional animals for cartage department
Eastern Line, Transvaal: Re-sleepering three miles 57 chains of track.
Newtown: Provision of two additional sidings.
Johannesburg: Extension of siding, east end of central platform.
Germiston: Renewal of lever frame in West Signal Cabin.
Pietersburg: Erection of two new houses.
Arnot: Provide new station building and quarters for stationmaster.
Breyten: Erection of six new houses.
Middelburg, Transvaal: Erection of new house for stationmaster.
Olifants River-Witbank: Renewal of the pipe line between.
Witbank: Provision of new machinery for running shed.
Waterval Boven: Provision of new machinery for running shed.
Pretoria: Provision of new machinery for running shed.
Elandslaagte: Improvements and extension of station yard.
Greyville: Provide new engine pits and remodel sidings.
Durban: Purchase of 30 additional animals and 15 sets of harness for the cartage department.
Durban: Purchase of 40 additional animals, 20 sets of harness, and 15 trolleys for the cartage department.
Natal Division—Standerton, Heidelberg, Volksrust and Bethlehem: Taking over of catering equipment from Messrs. Caterer's, Ltd.

Business Booming in Beira.

Important business movements are announced at Beira. Messrs. Allan Wack & Shepherd have absorbed the extensive business of Cotton & Downie, and Cotton & Co. The old firm of Meleny & Co. has been replaced by Mann, George & Co. (Beira). The engineering firm of L. E. May, from Delagoa Bay, has bought sites for workshops here, and several big Portuguese concerns have been initiated. Mr. A. L. Lawley has just passed through, and will return in May for new developments. Land is being applied for, and is being taken up by all and sundry. The Bank of Beira has opened, replacing the Banco Ultramarino, and Robert Hudson & Co. have their local representative here. A partner in Sir Douglas Fox & Co., Mr. Freeman, has arrived in connection with the Zambesi Railway, which is supposed to start in May next. The Beira Boating Co. is enlarging its plant on an extensive scale in anticipation of a line of Italian steamships commencing to trade with the port. A brisk boom in building is likely to ensue.

Rhodesian Dip: Proposed Factory.

Mr. W. B. Blyth, director of Standard Arsenic (South Africa), Ltd., is at present on a visit to Durban in connection with the proposal to erect a factory somewhere in the Union to deal with the product of the company's arsenic mine at Odzi. Mr. Blyth, says the *Natal Advertiser*, is considering the relative advantages of Germiston and Durban as manufacturing centres, and does not hesitate to say that so far, Durban claims seem the stronger. The company is manufacturing a prepared cattle dip, liquid arsenite of soda and white arsenic in Rhodesia, and will temporarily provide for Union requirements from that centre. The dip, which is known as the "Champion" is now very generally used in Rhodesia and it is hoped that this new industry will be successful here, and result in keeping down the price of arsenical products to a lower level than has been the case in the past. The company's chief asset is an unlimited supply of white arsenic which it can land at Durban via Beira at a very low rate.

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Notes and News.

Two Low-Grade Mines and the Gold Premium.

What the gold premium means to the low-grade mines is shown by the latest quarterly returns from the Simmer Deep and the Simmer and Jack. The loss made by the former in the three months ended December 21 is converted into a working profit of £5,355, and the £6,693 profit of the Simmer and Jack is increased by £30,431. In both cases the premium is taken at 19 per cent.

* * * *

A New "Goldfields" Director.

Information has been received to the effect that, at a meeting of the New Consolidated Gold Fields, held in London on 22nd January last, Mr. Geoffrey Dawson, late editor of the *Times*, was elected a director. This announcement is all the more interesting from the fact that Mr. Dawson, apart from his general knowledge of affairs, is very well acquainted with South African matters, having been Private Secretary to Lord Milner in South Africa from 1901 to 1905 and subsequently editor of the Johannesburg *Star* from 1905 to 1910. Mr. Dawson was educated at Eton and Magdalen College, Oxford, and is a Fellow of All Souls.

* * * *

The Premium on Rhodesian Gold.

The Rhodesia Chamber of Mines was advised on the 24th January by the Acting Secretary for Mines and Roads that the London office of the B.S.A. Company had cabled on the 19th that Messrs. Rothschilds had made the first distribution under the existing pooling arrangement on the 14th instant to producers participating in respect of gold sold up to 31st December, 1919, the average net price being about £5 2s. per fine ounce, which is equivalent to a surplus of 17s. per fine ounce, or ·20 per cent. It is understood that the banks will receive particulars in regard to the distributions to their customers per "Balmoral Castle," due to arrive at the Cape about 3rd February. Premiums realised on the sale of gold will be settled for at the end of each quarter.

* * * *

Minerals Separation Prospects.

The London Stock Exchange is all agog as to the remarkable advance that has taken place in the shares of Minerals Separation. A few weeks ago they stood at about £9, and are now in the neighbourhood of £20. The reason for the rise is said to be the application of the company's process to the recovery of coal from dumps and waste. The specific gravity of coal is so low in relation to other minerals that the quantity of the flotation agent required for its recovery is almost negligible. In fact, it is suggested that the total cost of recovering a ton of coal, to be converted into briquettes, is only about 5s., while the briquettes themselves can be sold at about 30s. a ton. Another point in connection with the business is that the 1s. 2d. per ton profit allowed to owners applies only to coal as drawn from the mine, and not to the dumps which will be treated by Minerals Separation. The company, it is said, has already purchased on its own account very large quantities of waste, while numerous collieries are contracting for the right to use the process.

* * * *

The T.C.M.E. Position.

According to the latest quarterly report of the T.C.M.E., the tonnage milled at that property during the quarter shows an increase of 510 tons, while the working costs increased by 2·8d. per ton. The working profit decreased by £547, or 3·9d. per ton. The whole question of labour continues to be very difficult and there is every indication that costs in this direction are about to increase considerably. Government is inquiring into conditions governing the supply of unskilled labour in the district, and it is hoped that some steps may be taken to improve things in this direction. Development footage at Central Mines has been increased by 1,886 feet, but the results at Ponieskrantz have shown some falling off in average payable [illegible] to be developed. Pr [illegible] continues to be steadily pursued, but with [illegible] apparent [illegible] success. At V[illegible], prospecting has been disappointing, but the programme of work is not yet complete. Glynn's reef continues to give promising results. At Elandsdrift lack of water has impeded operations, but the [illegible] complete, and it is hoped that this will help considerably. The plantations are in good order and there is now better demand for bark. For the month of January and onwards, profit declarations will include the approximate premium estimated to be earned on the gold produced for each month.

* * * *

The Modder B. New Shaft.

As was forecasted in our issue of a fortnight ago it has been decided to sink a further new shaft on the property of the Modderfontein B. Gold Mines, Ltd. The information is contained in the report for the quarter ended with 31st December, 1919, and we understand that this decision was arrived at some time ago. "It has been decided to sink an additional shaft in the western section of the mine in order to deal effectively with a larger tonnage from that area. In addition to greatly improving ventilation, the new shaft, which will be 1,700 feet deep, will enable men and material to be brought to the working faces in comparatively short time, a factor of great importance. Provided nothing unforeseen occurs, it is anticipated that the expenditure on both shafts with necessary equipment can be met without interfering with the recent rate of dividend." This new engagement of the company is obviously of very material importance, the more especially as the report states: "Reef disclosures continue highly satisfactory in the western section of the mine, but in the north-eastern section are still discouraging." If the controlling house people are not to be congratulated on the celerity with which they have given shareholders the benefit of their decisions in regard to the future shaft policy of the company, the secretarial department of that corporation is, we think, to be commended for the promptitude with which the quarterly report has been issued. In point of fact, the report was posted to shareholders a day before it was signed, which is pretty good going even for the premier mining institution of the Witwatersrand.

* * * *

The Diamond Boom in the States.

There seems no doubt that the total value of the diamonds imported into the United States, stated in currency, will be twice as much for 1919 as for any preceding year in the history of the diamond trade of the United States. It is estimated that the total value of the imports for 1919 will exceed 100 million dollars. This compares with 52 million dollars in the calendar year 1916, which was the highest previous record. The National City Bank of New York estimates that the aggregate value of the diamonds in the United States exceeds 1,000 million dollars. This calculation is based upon the official figures furnished by the Customs at the values at which the diamonds were declared in various years. The bank estimates that if this quantity of jewellery were valued at present inflated prices this enormous figure might reasonably be doubled. It is estimated that at the beginning of the century the total value of diamonds in the United States was something between 400 and 500 million dollars. During the present century diamonds to the value of 600 million dollars have been imported; and, consequently, the total value is estimated, as above stated, at 1,000 million dollars. More than half the diamonds of the world are now believed to be owned by citizens of the United States. It is, of course, a truism which has long been recognised, not merely as a result of the recent War, but practically ever since the diamond industry in South Africa became developed in its present form, that the prosperity, or otherwise, of the industry depended almost entirely upon the prosperity, or otherwise, of the United States of America. South Africa turns out something like nine-tenths of the diamonds produced throughout the world.

A New Iron Flotation.

In our advertising columns this week will be found the prospectus of the Newcastle Iron and Steel, Ltd., which is being floated with a nominal capital of £125,000. 85,000 shares of £1 each are now being offered to the public at par; and in view of the prospects doubtless the issue will be oversubscribed. The list remains open till March 4; and in our next issue we hope to print some further particulars regarding the possibilities of this very promising enterprise.

* * * *

The Currency Committee's Second Report.

In mail week Lord Cunliffe's Committee on Currency and the Foreign Exchanges issued its second report. Broadly speaking, it merely emphasises the conclusions reached in the interim report, but it is satisfactory to learn that the main recommendations, which must commend themselves to all business men, have been promptly adopted by the Government. By accepting the principal recommendation it has undertaken that the maximum of the fiduciary circulation of the currency notes in any year shall be the legal maximum for the following year. This maximum figure, according to the Chancellor of the Exchequer, was £320,608,298 in the past year, this being the total of the issue unsecured by gold and Bank of England notes, the latter being convertible into gold. At the date of the last return the fiduciary circulation of Treasury notes was £316,173,031, out of a total of £348,373,031. It will be seen, therefore, that there is a margin of only about 4½ millions between the present figure and the maximum to which the currency note issue can go . Apart, however, from this circumstance, it is a little difficult to see how a substantial increase in the currency notes could be prevented in certain eventualities. The Treasury Bills outstanding still considerably exceed £1,000,000,000, and if the holders of only 10 per cent. of this amount elected not to renew the bills, but to be paid off in currency notes, we should immediately have an addition of £10,000,000 to the issue, thus exceeding considerably the maximum of the year. The other recommendations of the Committee refer to the practice of borrowing on Ways and Means advances from the Bank of England, which, as was shown in the first report, has been a fruitful cause of credit inflation. In this matter also the Government has promised to be good, and the Chancellor has stated that high-water mark in the total of the National Debt will soon be reached, after which it is hoped there will be no new borrowing.

* * * *

State Coal Mines and Disaffection.

Following the agitation for the nationalising of coal mines, W. H. Triggs, a member of the Legislative Council of New Zealand, has written for the London *Times* an outline of the failure of such a policy in New Zealand, and has warned of the bad results which may be expected in Great Britain. Mr. Triggs states that nationalisation in New Zealand was entered into as a political experiment and was a complete failure. "So far from removing discontent among the miners, it is a fact that the State coal mines are the breeding-places of the most serious disaffection. Not only have labour disputes, which spread to the private mines, been hatched there in the first instance, but Runanga, the Government mining township, is notorious as a hotbed of sedition and Bolshevism. The explanation is very simple. The miners in New Zealand, as well as in other parts of the world, are being steadily attacked and corrupted by emissaries of those who, for purposes of their own, are seeking to destroy the present state of society. These agitators, who, in the majority of cases, come from overseas, are got rid of as quietly as possible if they are discovered carrying on their plots in private mines. Gradually the State mines in New Zealand have become a kind of Cave of Adullam to which the agitators and the disaffected miners have drifted. These are not interfered with unless their conduct becomes altogether outrageous and intolerable, the Government (and consequently Government officials) being always afraid of 'causing trouble' and losing votes among the Labour Party."

TOPICS OF THE WEEK.

A SOLUTION OF THE EXCHANGE AND CURRENCY PROBLEM.

The whole country is indebted to Mr. Henry Strakosch for the light he has thrown on the present critical exchange position of the Union, in the report from which we print extracts in this issue. Mr. Strakosch returned to the Rand only a few weeks ago from London, where he had won during the War a notable reputation for the sound advice and practical assistance he had given the Treasury authorities on the abstract problems of currency and exchange that had obtruded themselves during the dark days of that struggle. This journal was the first—indeed, we believe, the only—organ of public opinion in this country to invite the views of Mr. Strakosch on our monetary difficulties; and we are flattered to know that our example was promptly followed by the Prime Minister, at whose instigation Mr. Strakosch prepared his present contribution to the discussion of the burning topic of the moment. Our extracts but faintly reproduce the clearness, the consecutiveness, and, indeed, the inevitableness of his reasoning. He traces the present position of the exchange and currency of the Union back to first causes, and gives us quite the best exposition we have seen of the economic relations between this country, England, America and world conditions generally. Incidentally, Mr. Strakosch exposes a number of popular fallacies of the "natural exchange" order beloved of, and fathered by, publicists of the Jagger school. His handling of these rule-of-thumb economists is mercilessly effective, and makes one regret that he had not appeared earlier on the scene to stop some of the vapourings that have lately been filling the columns of our daily papers. The real value of Mr. Strakosch's pamphlet, however, is not dialectic or destructive. It is frankly constructive, and embodies what is to our mind the best proposal to remedy the existing anomalous state of the exchange and the currency of this country. Mr. Strakosch has already given the Government the benefit of his views and we make bold to say that, reading between the lines of the recent speeches made by General Smuts, the Government is bound to adopt more or less in their entirety the recommendations of Mr. Strakosch. Put very brief, the major portion of the present paper is devoted to proving (a) that a true gold standard cannot, under present world-conditions, be maintained in the Union, (b) that the process of restoring that true gold standard must be a gradual one, if a financial crisis is to be averted, and (c) that during this period of transition means must be devised to provide the country with a currency with which to "carry on." In his own words, "that currency must be of a kind which will freely circulate without danger of being withdrawn for the purpose of export and hoarding. It should inspire the utmost confidence, and should, therefore, have behind it a backing fully equal to its face value. The conditions under which it is issued must, moreover, be so framed as to provide thoroughly effective safeguards against an over-issue." To meet these conditions Mr. Strakosch proposes a scheme framed broadly on the following lines: Legislation should be introduced authorising the Government to create what may be termed "Treasury Gold Certificates." The conditions of their issue should provide that there shall always be deposited in the vaults of the Treasury an amount of gold coin or bullion which, taken at the standard price, is sufficient to redeem the whole outstanding issue. It will be appreciated that these notes will have a backing behind them which, taken at the current price of gold, largely exceeds their face value, and that this excess will only disappear when gold has once more receded to the standard price. With the present gold premium of, say, 30 per cent., it would require an expenditure of £130 to acquire the gold backing necessary for the issue of £100 of notes under the proposed scheme. The danger of over issuing these notes clearly does not exist; indeed the proposal errs, if anything, on the side of unduly restricting the creation of currency to meet the legitimate requirements of a possible trade expansion. These Treasury Gold Certificates should be made convertible into gold, but the Government should be relieved of that obligation so long as gold commands a price in the world's markets which exceeds the standard price. When that point is reached there will be immediately available in the vaults of the Treasury sufficient gold to redeem the whole of the outstanding notes. The effect of the scheme is to make the Government, so to say, the guardian of the country's gold currency during a time in which its free circulation is endangered by the extraordinary world conditions. Mr. Strakosch contends that the gold needed for the backing of the suggested issue of Treasury Gold Certificates should easily and rapidly flow to the vaults of the Treasury. The banks of the Union, who hold by far the largest proportion of the gold coin in the country, should be especially anxious to convert their holding into these Gold Certificates. "In that form," he explains, "their reserves are not liable to be drained for purposes of export and hoarding, and the banks would, therefore, be saved the necessity of replenishing them at very great expense or of keeping them at their proper level by the curtailment of their business. The gold coin held by the law-abiding public that is, the coin which is not withdrawn from circulation for purposes of export and hoarding, would in the natural course of things flow to the banks, and thence to the Treasury vaults in exchange for these Gold Certificates. The gold coin available in the country and in the course of importation should go a long way to provide the requisite volume of currency. Any deficiency will necessarily have to be imported by the banks. The burden of doing so would be in the nature of a final sacrifice." It will be seen that Mr. Strakosch's proposal differs little fundamentally from those made by Sir Evelyn Wallers, by Mr. Reynolds, the general manager of the National Bank, by Mr. D. C. Greig, and others. Only it is more precise, more definite, and in fine more attractive to the plain man who is neither banker nor financier. We can only hope that the Government will have the wit to recognise wisdom when they see it, and that, brushing aside the thick growth of sophistries and fallacies with which the subject is beset, they will give legislative effect to Mr. Strakosch's recommendations at the earliest possible moment.

The Public Revenue Returns.

The returns of revenue receipts for the nine months ending December 31st seem to justify the estimate that the Treasury forecast of revenue for the complete financial year will be exceeded by about three millions sterling. The Treasury estimate framed last session anticipated a revenue of approximately £23,000,000. At the end of December, with three months of the year to run, the receipts had totalled £17,296,000, but the last three months of the year are, from a revenue point of view, far the most productive. It seems that the Customs earnings for the year will exceed by half a million the estimate of £5,130,000. Excise will also show a substantial improvement on the estimate. The diamond mines are already beginning to yield substantial contributions from Government ownership share of the profits in the case of the Premier, and already the proceeds from this source exceed the estimate by £130,000, with three months' income still to accrue. The export duty on diamonds has produced in the nine months [illegible], against an estimate for the year of £800,000, and the heavy demand for diamonds is still continuing. The receipts from income tax, including normal, super and dividend taxes, have amounted in the nine month period to £2,310,000. The estimate for the year is £4,100,000; and there can be little doubt that if an effort is made to collect in the current [illegible] year the usual proportion of the amount due for the tax year, the receipts from this source will exceed the estimate by fully £500,000. The same remark applies to the Excess Profits duty which was expected to yield £1,350,000 and has produced in the nine months £682,000.

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THE SOUTH AFRICAN CURRENCY AND EXCHANGE PROBLEM.

Question of Surpassing Importance to the Country—Masterly Diagnosis of the Trouble—A Clear Exposition of its Complexities—What the Union Government Must Do to Save the Situation—Views of an Eminent Authority.

A FEW weeks ago an interview appeared in these pages with Mr. Henry Strakosch, the managing director of the Union Corporation, Ltd., on the subject of the currency crisis. Mr. Strakosch, who has only recently returned from England, is regarded as one of the first authorities in the City of London on the foreign exchanges, and it is an open secret that his advice was sought and acted upon by the British Government during the War. Mr. Strakosch has now prepared a paper on the currency and exchange problem as it affects South Africa, which, we venture to say, will become a classic. In his introduction Mr. Strakosch says: "The problem dealt with is not only of general interest, but its solution on right lines is of such surpassing importance to the well-being of the country that it can only be helpful if everyone who has given earnest thought to the subject submits his conclusions to public scrutiny and criticism. The pamphlet has its origin in a request from the Prime Minister for an expression of the writer's views on the problem. The main portion of the paper, together with the writer's conclusions, were presented to General Smuts towards the end of last month." For our part, we have no doubt that the Prime Minister will welcome and act upon the recommendations made by Mr. Strakosch. They are put simply and clearly; are based upon a reasoned, logical diagnosis of the case; and compel conviction by the moderate yet masterly manner in which they are advanced. Mr. Strakosch shows a grip of the complexities of the situation that is positively refreshing to those of us whose business it is to study the lucubrations of the amateur economists who have been filling the columns of the papers with their views of late. We deal with Mr. Strakosch's final conclusions in our leading columns. Here we will merely give a few extracts, which we hope will make every earnest student of the question possess himself of Mr. Strakosch's pamphlet.

One of the effects of the disappearance from circulation of the sovereign is to make it difficult for the banks to maintain adequate cash resources. To meet the position some of them are understood to have decided to curtail their business, and others have imported gold coin from England at very considerable expense. Both measures are of more than doubtful value. So long as a sovereign is exchangable for more than 20s. in Union currency, so long will it disappear from circulation. History provides us with many instances to show that no legislative or other measure will prevent the disappearance of currency in similar circumstances. Even if it were physically possible to prevent immediate export (which is very doubtful, for, in Europe, where frontiers are easier to guard than in South Africa, such attempts have always failed), it would continue to be withdrawn from circulation for the purpose of hoarding on the off-chance of export at a later date. Gresham's law—bad money drives out good—has never yet proved to be untrue. It is safe to predict, therefore, that sovereigns will continue to disappear from circulation. Those of the banks which are importing sovereigns at great expense and are recouping themselves by charging the exporter a higher rate of exchange are merely providing an opportunity for the illicit gold exporter to reap a rich harvest at the expense of the economically most useful section of the community, viz., the producers of exportable commodities. The policy which the other banks are said to be pursuing of restricting business must, at best, lead to a progressive curtailment of banking facilities, the detrimental effects of which need no emphasis. Action of a much more positive and comprehensive kind than the mere prohibition of export of coin is therefore needed to put the currency of the country and its credit structure on a safe footing.

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Before entering upon the discussion it is well to clear the ground by stating that no divergence of opinion can exist that the disappearance of the sovereign from circulation is due to the depreciation of our currency; that this depreciation has proceeded concurrently with that of the United Kingdom; that, generally, to maintain currency at a parity with gold, it must be made freely convertible into gold; and that, to maintain the Foreign Exchanges at their gold par, it is necessary to allow the free export and import of gold, both in the form of coin and bullion; and, finally, that a currency based on this true gold foundation is the soundest and the best. It is not the purpose of this investigation to call into question any of these well-recognised truths, but to examine whether, in the existing extraordinary world conditions, and having regard to South Africa's economic position and activities in relation to the rest of the world, it can afford to re-establish and maintain its currency on a true gold basis. It is, in other words, the object of these notes to weigh whether the advantages of a true gold standard in the existing economic conditions outweigh the sacrifices its maintenance would entail.

There is no country in the world to-day, except the United States of America, which permits the free export of gold. For South Africa, in the world conditions as they exist to-day, to venture upon a course which would compel it to share alone with the United States of America the burden of supplying the insatiable demand for gold the world over is clearly an experiment of a most hazardous kind. The huge accumulations of gold in the United States Treasury and the Federal Reserve Banks place that country in a position of incomparable superiority to face a heavy drain of gold as compared with the Union of South Africa, which holds a stock of comparatively infinitesimal size, and is only able to satisfy that demand out of its current production. But under the currency system obtaining in the United States of America, Federal reserve notes are covered by 40 per cent. of gold and 60 per cent. of trade bills. Upon that basis is built a vast structure of credit. The loss of 40 dollars of gold under that system involves a contraction of credit of 100 dollars. It will be appreciated that large withdrawals of gold, connoting as they do a contraction of credit two and a half times as great, may well create a situation of considerable discomfort in America. The contingency—though unlikely—should therefore not be left out of account that the United States of America may be forced by heavy withdrawals of gold to adopt means—perhaps not openly admitted—which would have the effect of making the export of the metal sufficiently difficult to impede the movement. In that case, the burden would fall practically entirely upon South Africa.

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South Africa's economic well-being not only demands that the capital invested in the country is retained there; it also requires fresh capital for the development of its vast dormant resources. If it had to rely solely on its own savings, that development would suffer a retardation which would be bound to have serious effects, for the whole economic scheme of the country has become accustomed to an unimpeded, almost continuous, flow of capital from abroad. The very fact that the United Kingdom currency is at a discount in relation to the currencies of countries such as the United States of America, the Argentine and Mexico, where a substantial part of English savings flowed before the war, tends to prevent English capital from migrating to these countries and to foster its investment within the Empire.

To illustrate how a high rate of exchange impedes the flow of capital into the country, let us suppose the Government were to put up for tender another of the Rand mining areas, the equipment of which would cost £1,500,000, of which 80 per cent., or £1,200,000, would be spent in the Union for wages and products of the country, and suppose the exchange of London were at 150 per cent. In that case, it would cost the English capitalist £1,800,000 in his own currency to pay for the £1,200,000 which have to be spent in South Africa. He will reason—and rightly so—that by the time the lease area is equipped—in, say, six years' time—and he can expect a return on his investment, the United Kingdom currency will be back to the gold par—i.e., on a parity with the Union currency. His investment would then have involved him in a clear loss of £600,000, by which his enterprise would be penalised through all its existence.

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It is perhaps well to make it clear that the raising of the exchange to a gold par will cause the loss of the gold premium on the whole of the output, including that portion which is normally paid in London as dividends, for, with Union currency at a premium, the foreign holder of South African shares will obviously cash his dividends in South Africa and not in London. A saving can only arise in respect of the amounts expended by the mines on purchases abroad, but that saving is comparatively small. The total value of the gold production of the Witwatersrand mines (taken at the standard price) in the year 1918 was about £34,800,000. Of this, only about £5,250,000, or about 15 per cent., was spent abroad.

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To abolish the embargo on the export of specie from the Union in such circumstances must inevitably lead to holders of bank notes demanding their exchange into gold for the purpose of export and, of course, to all gold coin circulating in the country being similarly exported. The serious position which such a run would create for the banks need not be emphasised, nor the difficulties of the country, which would be completely denuded of all circulating media, except perhaps the token coins. It is abundantly clear then that South Africa cannot, in present world conditions, restore its currency to, and maintain it on, a true gold basis.

The preceding pages sufficiently indicate how powerful and how varied the reactions are which the raising of the exchange to a gold par produce upon the whole economic organism. The drastic reduction of prices of all stocks in the country, the calling in of loans, the sale of stocks and shares from abroad, the stoppage of the accustomed flow of capital from abroad, and the impeding influence upon all productive industries are the typical forces which make for a crisis. It is the kind of crisis, born of unduly rapid deflation, which statesmen the world over strive to prevent, because of the disastrous effects—economic and political—it is liable to bring in its train. It is gradual deflation, accomplished by increased production of goods and decreased expenditure both by Governments and individuals and accompanied by the gradual and judicious reduction of the circulating media which is aimed at in order to restore sound conditions without exposing the economic organism to the fatal effects of a crisis.

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ESTABLISHING A SOUTH AFRICAN IRON AND STEEL INDUSTRY.

Momentous Developments Pending—The Iron Age and the Steel Epoch—Activity at Pretoria and Vereeniging—The "Expert" View—What the Union Steel Corporation is Doing—The Government and the Iron Industry—Huge Areas Investigated.

According to some archæologists, it is quite probable that the Iron Age had its birth in Africa, where the existence of extensive ancient iron workings has given rise to the belief that the Bantus who inhabited the Dark Continent in the dawn of time were amongst the earliest workers of the metal upon which civilisation has reared its edifice of progression. This may or may not be so; the matter is of academic interest only. But the fact that South Africa, despite the known existence of huge deposits of hematite, magnetite and chalybite in proximity to railways, coal beds and large deposits of satisfactory flux, has only recently begun to assume any measure of importance as an iron-producing country is of vast industrial interest and moment. The Transvaal iron fields and notably those in the vicinity of Pretoria have been known of for a great number of years and for at least a quarter of a century the establishment of an iron and steel industry in this country has been talked of. But for years this branch of the mineral industry got no further than the talk stage.

The Pretoria Iron Works.

The Harbord Investigations.

About ten years ago, however, Professor Harbord, an English iron and steel expert, investigated our iron ore deposits and made a report which very effectually damped the ardour of would-be creators of a South African iron and steel industry. Professor Harbord's conclusions were distinctly discouraging, and it has taken the potential iron industry of the country a good long while to live down the unfavourable impression created by the Professor's report, just as it took the Witwatersrand some time to live down the evil reputation it gained from one of its first "experts," who declared it to be an alluvial field of short-lived prospects.

The Dawn of Production.

In the last year or two, however, other investigators have expressed their well-considered convictions that the prospects of establishing a successful iron and steel industry in this country are positively alluring—we especially allude to the close examinations and optimistic conclusions of Professor Stanley and Dr. Wagner in this connection. But the most convincing testimony of all is to be found in the fact that an iron and steel industry has already been established.

Activity at Two Centres.

At the Capital, where the Pretoria Iron Mines, Ltd., has erected substantial buildings and equipment and has for some time past been busily engaged on smelting Transvaal iron ores, and at Vereeniging, where the Union Steel Corporation of South Africa has extensive plant and where also iron is being produced, the augury is for a steady advance in activity at these two centres.

Some interesting facts and figures regarding operations at Vereeniging were imparted the other day at the annual meeting of the Union Steel Corporation. The installation of a 3½-ton Herault electric furnace was completed last year, and this furnace has been constantly in operation since then, with considerable success. The steel made has been used in the manufacture of shoes, dies, and high-grade steel castings, for which there is an increasing demand. It has been decided to convert the 10-ton Siemens' open hearth furnace, the first erected at the works, into a 20-ton open hearth furnace. The corporation will then have two furnaces of this capacity, and the output will be increased materially in consequence. A new annealing furnace and drying stove have been erected, while an additional electric crane has been ordered to facilitate the handling of ingots and materials, the present electric crane being insufficient for the requirements of the works. The directors also recently decided to extend the smelter and foundry buildings by 100 feet to provide floor accommodation for the steel foundry, and proposed additions to the existing plant. The production of finished bars and castings during 1919 showed an increase on that of the previous year, despite some restriction of output during the first three months, consequent on the influenza epidemic. In addition to the ordinary output of castings, a considerable tonnage of shoes and dies has been manufactured and delivered to the mines. There is an excellent demand for the corporation's products, the high quality of which is well maintained. The corporation was able to dispose of its output without difficulty, chiefly to the Union Government, mines, and also to other purchasers throughout the Union, Rhodesia, and the Belgian Congo at prices which must be considered fair and reasonable, and during a period when the products manufactured by it were almost unprocurable elsewhere. As to the financial results, it is satisfactory to note that the gross profit on manufacture as shown by the profit and loss account to 30th September, 1919, was £105,339 6s. 9d.

The Government and the Iron Industry.

There is a perfectly understandable and general feeling abroad that the Union Government should evince a greater amount of interest in these matters than it does. Speaking at the annual meeting of the Union Steel Corporation held the other day, Mr. Geo. Falcke, who presided, said:

> At this critical stage of our development we feel that we are entitled to look for reasonable assistance from the Government of this country We claim that we have established an industry which has proved of inestimable value during the War, when products manufactured by us were most difficult to obtain. We were of the greatest possible assistance to the various mining industries of the country, in the success of which this country is so deeply involved. We have done much in training young Afrikanders and in finding employment for them, and, needless to say, every expansion means further employment. I have no hesitation in saying that we look forward hopefully to receiving in the future every consideration from the Government. During the war period many industries have sprung up in the country. A large impetus has been given to agriculture by reason of the increased exports of farm produce, wool, meat, etc. Every district in the Union is clamouring for railway facilities. Expansion is evident in every direction. We are told by our leading statesmen, especially those who have visited Europe within recent years, that large numbers of better-class emigrants are waiting an opportunity to come and settle in South Africa. The influx of an energetic type of immigrant is bound to influence progress in this country. In the immediate future new gold mines will be opened in the Far East Rand. The working of base metals and minerals is receiving constantly increasing attention. Within recent years distant parts of the continent of Africa have become accustomed to draw their requirements as far as possible from the Union. I mention all these facts because they are bound to have a great effect upon the demand for the products of your corporation, and to show that there is plenty of room for the expansion of our activities.

Huge Developments Forecasted.

South Africans are preverbially ignorant of their own country. It would assuredly astonish most people in the Union if an accurate estimate of the workable iron ore resources of this country was published, for it demonstrates the existence of mineral wealth far in excess of the most sanguine estimates. It would astonish most readers of this journal, too, if they knew the extent of the investigations which have recently been conducted into the vast possibilities of the hematite and magnetite ranges of the Pretoria, Utrecht, Rustenburg, Waterberg, Middelburg, Marico and Zoutpansberg districts of the Transvaal and the highly encouraging analyses which have resulted from these investigations.

The Coke Problem.

Concurrently with the development of our iron ores we shall have to embark on a saner and more industrially sound exploitation of our coal resources. As was remarked in the Special Coal Number of this journal, published a week or two ago, it is only now beginning to be realised that coal is a precious mineral. This feeling has led to the appointment of many Commissions in Britain, beginning with Fuel Economy and Fuel Research Commissions and going on to a Nitrogen Committee. For the first matter of importance is to get out high fuel values for those industries, such as iron smelting, that require heat. Quite an amazing story of neglect and indifference is revealed when the history of this matter of the past use of coal is studied. A Fuel Committee, consisting of Professor Bone, Sir Robert Hadfield, and other authorities, recently presented a preliminary report on this subject of waste of heat values. They say at the outset of their report that their object was to study the present state of fuel consumption, and they pay great attention to the problem of using surplus blast furnace and coke oven gases which hitherto have been wasted. They say, too, that it has been shown that the heat of these surplus gases has been shown to be sufficient not only for converting molten iron from the blast furnace into steel but also for rolling the resulting ingots into finished steel sections. They conclude the first part of their report by declaring that they are warranted in regarding the consumption of no more than 1·75 tons of good coking coal per ton of finished steel sections as a practical ideal for a modern plant. This figure of 1·75 tons of coal per ton of finished steel is set as the immediate goal in the iron and steel smelting industry. Such a quantity of coke could be produced in South Africa for a very small sum. The mining of the coal needed would not be more than 8s., and the coking, if proper plant is employed would not cost more than 12s. more. Handled on a large scale, cheap coke will be one of the greatest advantages that South Africa will possess to set against her higher costs in other departments of a smelting industry.

It is an economic and historical truism that the progress of a State stands almost in direct proportion to its coal, iron and steel industries. There is no doubt whatever that the power of Great Britain rests to a large extent upon its coal areas and iron and steel works, and that the United States would not have a population of over a hundred millions if it had to import its coal and iron and steel goods. The future of the iron and steel industry of South Africa is a matter which so closely touches upon our national life and future that we feel sure nobody will disagree with Mr. Falcke's remarks on the subject of Government interest. Neither will anyone who has knowledge of the facts deny that there is every indication of tremendous development of these essential branches of our mineral industry within the next few years.

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Crown Mines Shows Greatly Improved Results—Influences of the Gold Premium and Reorganisation—The Company Coming into its Own Again Development of the Southern Section.

THE influence of the premium on gold has been of very material benefit to all mines operating along the Witwatersrand, whether they be rich or poor, or outcrop or deep level, propositions. But it follows that some companies have gained more benefit than others and if an investigation be made into the incidence of benefit for each and all of the gold mines of the Rand it will be ascertained that no other company's profits and prospects have advanced so greatly during the past few months as those of the Crown Mines. The improvement in profit earning is reflected in the vastly better dividend paid out at the end of last month, namely, 35 per cent., or 3s. 6d. per 10s. share, which compares with only 6d. in June, 1919, and 6d. in December, 1918. In the main this greatly improved position is due to the premium obtained on the sale of the company's produce, although a reduction in working expenses has also assisted very materially.

HOW PROFITS HAVE BEEN PILED UP.

A year ago the Crown Mines group of Central Rand propositions earned only £12,970, or 2s. 1d. per ton milled. This was achieved by the crushing of 124,000 tons for a revenue of £183,948, or 29s. 6d. per ton. Working costs were as high as 27s. 5d. per ton. Subsequently a reorganisation of underground work was effected, and working expenses showed rapid and substantial reduction. The marked improvement in returns is reflected in the appended table setting forth the outputs and profits, etc., secured by this company during last year:

		Revenue.			Cost.		Profit.		
			per ton.		per ton.			per ton.	
	Tons.	£	s.	d.	s.	d.	£	s.	d.
January	140,000	205,110	29	4	26	4	18,380	2	7
February	124,000	183,948	29	6	27	5	12,970	2	1
March	160,000	222,861	27	9	24	3	25,468	3	2
April	158,000	219,786	27	10	23	5	32,107	4	1
May	164,000	227,861	27	9	23	0	37,467	4	7
June	168,000	234,993	27	11	22	3	44,538	5	4
July	179,000	243,658	27	2	21	4	48,978	5	6
August...	176,000	240,499	27	3	21	2	50,812	5	9
September	176,000	247,668	28	1	21	3	57,012	6	6
October...	182,000	250,387	27	6	20	10	59,647	6	7
November	163,000	233,285	28	7	22	6	49,386	6	1
December	155,000	209,626	27	0	25	1	24,185	3	1

AN OUTPUT OF OVER £300,000.

The revenue for last month, based on a price of £5 7s. 6d. per oz. for fine gold, shows that the company crushed 176,000 tons for a yield of £281,271 and earned a profit of £88,825, or 21s. 10d. per ton. This is a highly satisfactory record, but in point of fact a much better result was actually achieved since the present price of gold is now about 15s. per oz. higher than the sales figure upon which last month's returns were based. Crown Mines, once the pride of the Rand and latterly one of the most disappointing large gold mining ventures on earth, seems indeed to be coming into its own again.

PROGRESS OF THE NEW SHAFTS.

The development of the large southern area of the company's ground is being pushed ahead with. At the end of 1919 No. 15 shaft had been sunk to a depth of 3,114 feet and the No. 5a shaft to a depth of 941 feet. These two pits are designed to exploit the area below the 19th level. The No. 15 shaft in which some record sinking performances have been achieved has been sunk from surface and the 5a shaft, which is a sub-vertical, has been put down to a depth of over 1,000 feet from the 19th level north of the dyke.

PERSONAL.

Mr. J. G. Griffin, of the Griffin Engineering Company, has returned to the Rand.

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Major Tudor Trevor, Inspector of Mines, Pretoria district, who has been on a special mission to London to interest British capital in Union base betals, has returned to Pretoria.

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The Consolidated Goldfields gold medal and premium of forty guineas has been awarded by the Institution of Mining and Metallurgy, London, to Dr. Mellor for his paper on "The Rand Conglomerates."

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With deepest regret we have to announce the death of Mr. C. D. Leslie, lately consulting engineer to the Consolidated Gold Fields, which occurred in a railway accident to the Natal mail on Wednesday night. Mr. Leslie had only lately given up mining for farming, and the deepest sympathy will go out to his sorrowing wife and family. Mr. Leslie was last year President of the S.A. Institution of Engineers, and he has long played a foremost part in the mining world of the Rand.

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The departure for England the other day of Mr. G. Imroth seems to have passed unnoticed in the daily press. Mr. Imroth was seen off at the station by a large number of leading citizens and his going is a distinct loss to the whole mining community. It is hoped that Mr. Imroth will return to the Rand, where he has spent so many years, and that his sojourn in England may be regarded merely as a visit.

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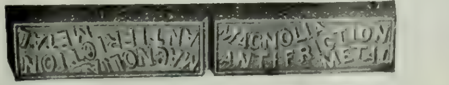

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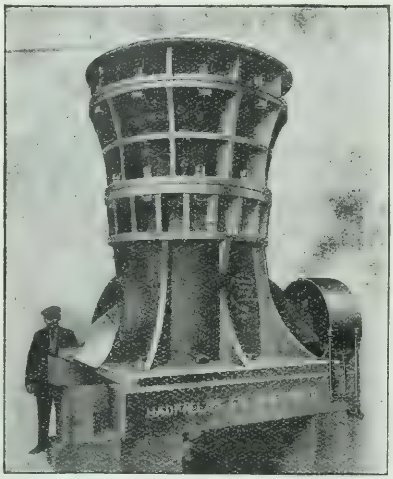

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NATIVE MINERS AND THEIR DISADVANTAGES.

The Evils of Kitchen Kaffir—Jargon and its Influence on Accidents—A Plea for Intelligible Language—More About the Training School Scheme.

In our last two issues we referred at some length to the problem of increasing the complement of the native labour force available for the gold mining industry and also to the advisability of establishing mines training schools in recruiting centres, where natives could obtain some elementary tuition in the fundamental principles of mining before coming to the Witwatersrand.

Views of Correspondents.

This latter suggestion has engaged a good deal of interest and we have received several letters on the subject. Each of our correspondents commends the scheme, and we certainly think it is worthy of the earnest consideration of the Government and particularly of the Educational, Mines and Native Affairs Departments of the country. One correspondent suggests that agricultural training colleges for natives should be founded as well as coloured mining schools, since the farmer is largely dependent on the efficiency of the native labourer as well as the mine owner. This is certainly common sense, and it is a fairly obvious corollary to the mining schools suggestion. But in so far as mine work is concerned the idea has, it seems to us, a stronger recommendation than in the case of any other industry, because underground operations are so entirely foreign to the experience of a raw native. After all, most "boys" have some small practical knowledge of agricultural and pastoral pursuits, which is gained in their own country and amongst their own people. We do not seek to deny the obvious truism that some training in the principles of agriculture would be very beneficial both to farm labourers and farm owners, but the recommendation for training in the A.B.C. of mining is immensely stronger than in the case of farming.

The Difficult Probation Period.

Natives who come to the Witwatersrand for the first time have to spend a considerable portion of their indenture in learning not only the first ideas of breaking, lashing and transporting rock, but they have first of all to learn the fundamental truths of safety work in mining. The conditions are absolutely strange to them. The rapidity with which a raw recruit develops into a capable coloured miner depends of course on the inherent ability of the native. This is an inconstant factor. But it is obviously true that each and every new native works under a great disadvantage during the first few weeks of his contract on the Rand and is peculiarly subject to the accidents which are inseparable from mining work. In this connection we have a further suggestion to make, and that is in regard to the influence of the white man in these matters. The raw boy coming from, say, a village in Mozambique, wholly bewildered and not a little terrified at his strange surroundings, looks to more experienced workers of his own colour for guidance and advice. But most particularly does he expect from his white baas a timely warning when danger is at hand or an enjoinder to avoid certain practices which are notoriously hazardous.

The Jargon of the Mine.

But in actual practice what does the native get? Usually a well-meant but wholly meaningless jargon of kitchen Kaffir, English and Dutch adulterated with many weird oaths. "Pas op lo etc., etc., hanging." "Pas op lo etc., etc., cocoa pan." "Lo —— dynamite imooshla ena bulala wainah, you three different kinds of a —— fool." "Pas op panzi." "Pas op pezulu." This is the sort of language on which many natives have to depend for warning and advice. Is it any wonder that Jonas from the Transkei and Antonio from the East Coast become more and more bewildered and as like as not rush into danger instead of getting out of it? The remedy lies, of course, in the direction of introducing a *ligua franca* into the subterranean hives of industry of the Reef—a language which is intelligible to the natives and which is not difficult in the learning from the white ganger's point of view. Anyone who has laboured underground will tell you that this lack of understanding between raw natives and well-meaning but non-linguistical white men is responsible not only for much loss of time and efficiency but is also answerable for considerable loss of life and damage to limb amongst both whites and natives. We think then that a necessary addition to the curriculum of a miners' training school would be a knowledge of common phrases employed underground. It might indeed be good business if it was demanded by the Mines Department of every ganger who had natives under his care that he had a simple knowledge of the language employed by the natives working under him, a knowledge sufficient to make the native understand just exactly what danger threatened him and how it was to be avoided.

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BY-PRODUCT INDUSTRY.

Industrial Possibilities of Coal.

A correspondent writes: Under the above heading on page 17 of the Special Coal Number of your journal appeared a sketch showing the development of a number of by-products from coal. It will be seen that tar splits up into six main products (by distillation), viz., first runnings, light oil, middle oil, heavy oil, anthracine oil, and pitch. From the middle oil fraction is developed crude carbolic acid, and pursuing the process according to the diagram creoline is erroneously shown as directly produced therefrom. Creoline, which in South Africa goes under the name of hycol, is not produced from carbolic acid; it contains no carbolic acid, and unlike carbolic acid derivative disinfectants, is non-poisonous in use. Compared with creoline, carbolic acid is a comparatively weak bactericide, and further is very caustic in its action, particularly on animal tissues. Lysol is correctly designated on the diagram as being produced from cresol. Even lysol, a recognised disinfectant, is poisonous, is caustic in action, and comparatively with creoline is inferior in bactericidal value. Thus creoline—or hycol—is a disinfectant which, whilst not possessing the bad effects of either carbolic acid or lysol, is further superior in its destructive value on germs. It is not produced from either carbolic or cresylic acids. It is developed from a direct mixture of fractions of both middle and heavy oils after considerable selection, refinement and addition of specialised emulsificants.

Mr. C. McDermid, the secretary of the Institution of Mining and Metallurgy, writes: "The following awards have been made by the Council of the Institution of Mining and Metallurgy: (1) Gold medal of the Institution (premier award) to Mr. H. Livingstone Sulman, M.Inst.M.M., in recognition of his contributions to metallurgical science with special reference to his work in the development of flotation and its application to the recovery of minerals. (2) "The Consolidated Gold Fields of South Africa, Ltd.," gold medal to Mr. William Henry Goodchild, M.Inst.M.M., for his papers on "The Economic Geology of the Insizwa Range" and "The Genesis of Igneous Ore Deposits." (3) "The Consolidated Gold Fields of South Africa, Ltd.," premium of forty guineas to Dr. Edward Thomas Mellor, M.Inst.M.M., for his paper on "The Conglomerates of the Witwatersrand."

Southern Van Ryn.

We have received the following return of assays of development on the Southern Van Ryn Reef G.M. Co., Ltd. These returns apply to the Van Ryn Reef developed from No. 1 incline shaft, north drive. North drive, No. 1 incline shaft at 240 ft., 45 dwts. over 15 ins.; 245 ft., 17 dwts. over 18 ins.; 250 ft., 9·4 dwts. over 24 ins.; 255 ft., 6 dwts. over 26 ins.; 260 ft., 7·3 dwts. over 36 ins.; averaging 13·6 dwts. over 23·8 ins. Individual sections: 32·5 dwts. over 9 ins.; 19·35 dwts. over 12 ins.; 12·25 dwts. over 14 ins.; 11·25 dwts. over 12 ins.; 45 dwts. over 15 ins. The last quarterly report included 45 dwts. over 15 ins. above. From that point for 40 feet, *i.e.*, from 200 to 240, average assay was 9·5 dwts. over 15 ins.; from 240 to 260 ft., 13·6 dwts. over 23·8 ins.

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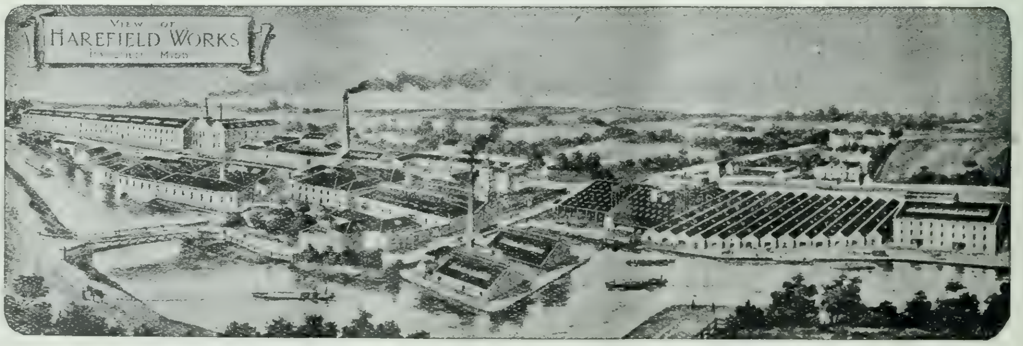

VIEW OF GENERAL ASBESTOS WORKS, HAREFIELD, MIDDLESEX.

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1919 ON THE STOCK EXCHANGE.

Prices Reflect the Rising Gold Premium—A Year of Exceptional Activity.

Last year was an exceedingly eventful and active period in Stock Exchange circles. It is true that in the early months of 1919 the optimistic hopes which were held out at the time of the Armistice did not materialise. Business sagged materially and the plight of the low-grade mines and the warning issued by the President of the Chamber of Mines to the Government and to the public at large that a crisis was pending caused prices to fall away materially. And then like manna from heaven the blessing of the gold premium fell upon the market and quotations for the latter half of the year reflect the steadily increasing price of the metal. If stockholders had to tighten their belts during the lean months, they have assuredly reaped a wonderful harvest since July last. Throughout the year diamond stocks have been buoyant and tins and coal shares have been steadily firm. In the following tabulation are given the local prices for typical listed stocks at the beginning and the end of last year, that is to say on January 3rd and December 20th.

	Jan. 3.		Dec. 20.	
	s.	d.	s.	d.
African Farms	15	6*	15	9*
Anglo-American Corporation	—		55	0*
Apex Mines	—		7	6*
Bantjes Consolidated ...	2	3	4	6*
Brakpan Mines	66	0*	72	6
Breyten Collieries	11	6*	—	
Brick and Potteries	3	6*	4	9
British South Africa	21	0*	—	
Bushveld Tins	0	8*	2	9†
Cassel Coals	—		28	6*
Cinderella Consolidated ...	—		7	0†
City Deeps	44	0*	65	0
Consolidated Main Reefs ...	11	0*	13	6*
Cons. Mines Selection ...	24	6*	30	0*
Coronation Freeholds	1	2	2	4
Daggafontein Mines	23	0*	19	0
East Rand Coals	2	3*	2	9†
East Rand Deeps	0	11*	—	
East Rand Proprietary ...	5	3*	11	6
Frank Smith Diamonds ...	3	6†	10	6
Geduld Proprietary	37	6*	61	0†
Glencoe Collieries	6	0*	5	3*
Glynn's Lydenburgs	25	0*	17	6†
Government Areas	89	0	99	0
Jupiters	4	6*	6	9
Knight Centrals	5	9*	7	3
Lace Proprietary	10	3*	20	0
Leeuwpoort Tins	26	6	29	3
Modder B.'s	150	0†	188	0†
Modder Deeps	143	9*	54	9‡
Modder Easts	18	9	30	3
Do. Options (3 years)	4	7	11	3
Do. Options (4 years)	5	9*	13	3*
New Boksburgs	1	0*	2	0
New Eland Diamonds ...	23	9*	83	0
New Era Consolidated ...	9	6*	12	6*
New Kleinfonteins	10	3*	13	6
New Modder	£25‡*		£34	
Pretoria Cements	58	0*	100	0
Princess Estates	2	7*	3	1*
Rand Selection Corporation	78	6*	102	6
Randfontein Estates	13	6*	25	6
Rooibergs	7	0*	8	0*
Simmer Deeps	2	6†	3	0
S.A. Lands	6	0*	6	8
Springs Mines	66	3	55	3
Sub Nigels	26	6	20	3
Transvaal Lands	23	6*	—	
Transvaal G.M. Estates ...	12	6*	16	0
Van Ryn Deeps	66	3	99	6
Witwatersrand Deeps ...	13	6*	15	0
Wolhuters	3	3	5	9
Zaaiplaats Tins	15	6	8	6
Union 5 per cent.	£102‡		—	

* Buyers. † Sellers. ‡ 5s. shares.

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PROGRESS ON THE "C.M.S." SUBSIDIARIES.

Effect of the Gold Premium at Brakpan and Springs—Shaft Sinking at West Springs and Daggafontein.

THE directors of the Brakpan Mines report that the linear development for the quarter amounted to 4,208 feet, of which 2,665 feet were on reef averaging 9·75 dwts. over a reef width of 39·53 inches. Of the footage on reef 1,190 feet, equivalent to 44·7 per cent., were in payable areas and averaged 17·39 dwts. over 42·06 inches. The payable ore reserve as at December 31, 1919, was estimated at 2,484,117 tons of an average assay value of 8·74 dwts. per ton over an average stoping width of 70 inches. This is an increase of 105,352 tons as compared with the previous estimate, the average assay value of the total being 0·06 dwt. per ton lower and the stoping width 1 inch wider than that estimated at the end of June. The inch-dwts. figure is 611 as compared with 606. During the quarter a distance of 489 feet was sunk in No. 3 circular shaft, making the total depth of the shaft 2,290 feet, of which 2,226 feet are bricked or ringed. The shaft was in the Kimberley series and intersected several reefs which were carefully sampled. The assay results were quite unpayable. The installation of a large diameter ventilation column and the change over to a more powerful hoist were completed during October; sinking operations were consequently suspended during the greater part of that month. During the quarter No. 4 circular shaft was sunk 153 feet, making the total depth 2,487 feet, of which 2,421 feet are bricked or ringed. Towards the end of October water was encountered but fortunately not in heavy quantities. Cementation was proceeded with and the operations in connection with this process occupied the remaining time. On the successful completion of this work —early in the current quarter—sinking was resumed. The premium on gold deposited from July 25 to December 31, on a basis of 19 per cent., amounted to £83,176 16s. The capital expenditure incurred during the quarter amounted to £32,705 0s. 10d. The company was assessed under the Miners' Phthisis Act, 1919, for the quarter ending January 31, 1920, at £5,698 18s. 6d. Operations during the quarter were affected by the shortage of native labour. The position, however, has shown an improvement, which will be reflected by the tonnage results for January.

SPRINGS MINES.

The linear development for the quarter at Springs Mines amounted to 4,423 feet, of which 2,610 feet were on reef averaging 15·69 dwts. over a reef width of 19·26 inches. Of the footage on reef 1,450 feet, equivalent to 55·6 per cent., were in payable areas and averaged 21·50 dwts. over 21·92 inches. The valuation of the payable ore reserve as at December 31, 1919, is as follows:—2,417,298 tons of an average assay value of 8·74 dwts. over an average stoping width of 62·92 inches. This is an increase of 173,364 tons as compared with the previous estimate, the average assay value of the total being 0·01 dwt. per ton higher and the stoping width 0·7 inches wider than the estimate as at the end of June. The inch-dwt. figure is 550 as against 543. No. 3 shaft was sunk 588 feet, making the total depth at the end of the quarter 2,631 feet, of which 2,604 feet are timbered. Early in the quarter the shaft entered into the Kimberley slates at a depth of 2,089 feet. At the end of the period the shaft was again in quartzite. A start has been made at No. 4 shaft on the work necessary prior to the commencement of sinking operations. Test pits have been sunk, and the construction of the road to the site of the shaft is proceeding. The expenditure on lease area capital account for the quarter amounted to £35,472 2s. 6d. Under the agreement in connection with the acquisition of the lease area the Consolidated Mines Selection Co., Ltd., took up during the quarter 3,500 shares in the unissued capital of the company at £3 per share to provide further working capital. The issued capital now, therefore, stands at £1,196,736. The amount accruing from the premium on gold deposited since July 25, based on a premium of 19 per cent., is estimated at £74,938 0s. 8d. The company was assessed under the Miners' Phthisis Act, 1919, for the quarter ending January 31, 1920, at £3,822 14s. 11d. A special settlement has now been granted by the London Stock Exchange on all shares of the company issued during the War period. Holders of option certificates to bearer, granted by the Anglo-American Corporation of South Africa, Ltd., at 22s. 6d. per share, are reminded that the Peace Treaty between Great Britain and Germany was ratified on January 10, 1920, and the options are, therefore, exercisable within one year from that date, namely, up to and including January 9, 1921.

DAGGAFONTEIN MINES.

Of the footage sampled during the quarter, 82·4 per cent. showed payable assays, and averaged 35·7 dwts. over 10·2 inches. A similar analysis of the total development to date showed 46·8 per cent. of payable footage, assaying 28·90 dwts. over 16·19 inches. Good progress was made in the west haulage. The 3rd haulage north was in dyke during the greater part of the quarter. After the dyke had been traversed, the reef was prospected for by means of diamond drilling. Information was obtained as to the throw on the north side of the dyke. In view of the dip of the dyke, however, it was decided to start the haulage up again, and to put up a new diamond drill hole as soon as the face had advanced some distance from the disturbance. The third unit at the bottom pumping station was completed, and the centrifugal pumps at the intermediate station were put into commission. This marks the completion of the pumping

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scheme adopted for this shaft. The installation of a fan completed the programme in respect to ventilation. Conditions underground are now greatly improved and a vigorous development policy will be inaugurated as soon as some alterations to the drums of the large winder have been effected; the development footage, in the meantime, being limited by the capacity of the second hoist. No. 2 shaft was sunk 606 feet, making the depth at the end of the quarter 2,969 feet, of which 2,943 feet are timbered. At a depth of 2,478 feet the Kimberley slates were encountered. Early in the current quarter the shaft entered into the amygdaloidal diabase. During November the shaft was sunk 236 feet and timbered for a distance of 240 feet. It is believed that this represents a record month's footage sunk for this type of shaft. The Rand Water Board purchased 23,590,000 gallons of water during the quarter. The company was assessed under the Miners' Phthisis Act, for the quarter ending January 31, 1920, at £588 6s. 3d. The four-year options, granted under the flotation agreement, to take up 125,000 shares at 22s. 6d. in the capital of the company expire on March 27, 1920.

West Springs.

During the quarter No. 1 shaft was sunk 583 feet, making the total depth at the end of the quarter 982 feet, of which 952 feet are timbered. The erection of the large winder was practically completed, this hoist being put into commission early in the current quarter. The drill sharpening shop and foundations for the condenser were completed. During the quarter No. 2 shaft was sunk 171 feet to a depth of 591 feet. of which 564 feet are timbered. The shaft passed through the dolomite and entered the Witwatersrand quartzite. A chamber for the pumping plant to deal with the dolomite water was cut, the sump also being completed during the period under review. The erection of the pump and motor is proceeding. Arrangements were made to utilise the dolomite water for the boiler plants at both shafts. The second hoist at No. 2 shaft was put into commission and the engine-house was completed. Details of the quarter's development, together with a summary of the work so far accomplished by Springs Mines, Ltd., in this company's property, under the working agreement, are as detailed below: Working place—East haulage, west face, footage on reef 178, footage sampled 190, width 16·66 ins., value 20·02 dwts.; for quarter, footage on reef 178, footage sampled 190, width 16·66 ins., value 20·02 dwts.; previously reported, footage on reef 780, footage sampled 760, width 21·34 ins., value 8·13 dwts.; totals and averages, footage on reef 958, footage sampled 950, width 20·40 ins., value 10·08 dwts. At the end of the quarter the east haulage, west face, had traversed the shoot of payable ore and was, for the time being, exposing reef of low value. The haulage was in the payable shoot for a distance of 495 feet, the average value of the reef being 14·2 dwts. over a width of 24·6 inches. During the period under review, advance payments of 18s. per share were made in respect of 32,532 shares 2s. paid up, and these shares were issued as fully paid up. The capital of the company now, therefore, stands as follows:—435,532 shares fully paid up; 964,468 shares 2s. per share paid up. Holders of option certificates to bearer, granted by the Anglo-American Corporation of South Africa, Ltd., to take up shares in this company at 22s. 6d. per share, are reminded that the Peace Treaty between Great Britain and Germany was ratified on January 10, 1920, and the options are, therefore, exercisable within one year from that date, namely, up to and including January 9, 1921.

Impregnation of Cement.

Samples and photographs of a Danish invention, together with a report for impregnating cement, may be seen at the Enquiry Office of the Department of Overseas Trade, 73, Basinghall Street, E.C.2. It is understood that the process is regarded as having established its claim to practical utility, and that besides the purchase of the rights by a well-known Danish company, the invention has already been taken up by a Norwegian company. Negotiations are also being carried on for the sale of the invention in Sweden, Holland, Germany, United States of America, the Argentine, and Mexico.

The invention consists in the composition of a fluid in which the cement pipes are dipped and it is claimed that the fluid thoroughly impregnates the pipes, which become thereby as serviceable for drainage and similar work as the glazed earthenware pipes generally used.

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THE JANUARY OUTPUT: GROUP RETURNS.

Central Mining/Rand Mines Group.

The following are the results of crushing operations of the Central Mining/Rand Mines companies for the month of January:—

Company.	Tons crushed.	Yield in Fine Gold Ozs.	Estimated Value.	Estimated Profit.	Estimated Working Costs per Ton.
City Deep	56,000	23,828	£127,018	£52,079	26/ 9
Cons. Main Reef	46,800	15,958	86,424	18,682	28/11
Crown Mines ...	176,000	52,821	281,271	88,825	21/10
Dur. Rood. Dp.	23,000	6,853	36,445	*2,128	33/ 6
East Rand Prop.	125,000	33,111	178,219	29,098	23/10
Ferreira Deep ..	34,100	10,570	57,337	13,427	25/ 9
Geldenhuis Dp.	48,000	13,060	69,570	6,990	26/ 0
Knight Central .	20,300	6,844	36,112	5,780	29/10
Modder B. ...	56,000	26,096	141,069	74,826	23/ 7
New Modder ...	81,000	41,852	225,098	137,209	21/ 8
Nourse Mines ...	42,000	13,335	71,044	11,981	28/ 1
Robinson	37,200	8,320	44,741	4,770	21/ 5
Rose Deep	52,000	12,435	66,273	14,128	20/ 0
Village M.R. ...	20,900	5,192	27,702	3,337	23/ 3
Wolhuter	29,800	8,272	45,284	11,492	22/ 8
Village Deep ...	44,000	13,408	71,611	7,772	29/ 0
Tls. & averages	892,100	291,955	1,565,218	478,259	24/ 4

* Loss.

In arriving at the above results the gold output has been valued at £5 7s. 6d. per fine oz., less costs of realisation.

Consolidated Mines Selection Group.

The following are the results of operations for the month of January:—

	Stamps Working.	Tons Milled.	Working Costs per Ton Milled
Brakpan Mines	110	48,400	28/ 7·555
Springs Mines	80	40,500	28/ 3·651
Totals and averages ...	190	88,900	28/ 5·780

	Value of Gold declared.	Yield per Ton.	Working Profit.	Working Profit per Ton.
Brakpan Mines ...	£86,038	35/ 6·633	£16,754	6/11·078
Springs Mines ...	75,968	37/ 6·184	18,652	9/ 2·533
Totals & averages	£162,006	36/ 5·364	£35,406	7/11·584

	Estimated Premium on output taking Gold at £5 7s. 6d. per fine oz.	Total Estimated Profit.
Brakpan Mines	£23,125	£39,879
Springs Mines	20,473	39,125
Totals and averages	£43,598	£79,004

Brakpan.—Gold reserve unchanged, 3,724 fine ounces.

Transvaal G.M. Estates.

The following are the particulars of the output of the Transvaal G.M. Estates for the month of January: Central Mines: Tons crushed, 13,200, yielding 3,800 fine ozs. Elandsdrift Mine: Tons crushed, 1,280, yielding 1,111 fine ozs. Vaalhoek Mine: Tons crushed, 2,000, yielding 759 fine ozs. Estimated value of month's output, £32,873; estimated profit for the month, £8,382. The above figures are arrived at by taking the value of gold at £5 7s. 6d. per fine oz. The grade at Central Mines was abnormally low. of gold at £5 7s. 6d. per fine oz.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of January of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs	Total Profit
Simmer and Jack ...	320	7	46,100	10,767	£5,792
Robinson Deep	140	9	50,300	16,607	20,030
Knights Deep	400	11	88,800	15,111	5,531
Simmer Deep	220	10	45,800	9,631	519
Jupiter	80	5	22,600	5,330	754
Sub Nigel	30	2	9,600	5,356	9,365
Totals	1,190	44	263,200	62,802	£41,991

Gold in reserve.—Simmer and Jack, 625 ozs.; Robinson Deep, 666 ozs.; Sub Nigel, 1,930 ozs.; total, 3,221 ozs.

Revenue derived from gold for the month of January is calculated at the rate of £5 7s. 6d. per fine ounce.

Simmer and Jack.—Scarcity of native labour was severely felt on this mine.

Simmer Deep and Jupiter.—In the case of these two companies, disorganisation on account of strike in December and scarcity of native labour affected operations for the month of January.

New Heriot.

The following are the results of the New Heriot Company's operations for January:—Ore milled, 11,500 tons; gold recovered, 3,174 ozs.; profit, £86. The gold produced for the month has been valued at £5 7s. 6d. per fine oz.

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Union Corporation.

Results of operations on the producing mines of this group for the month of January:—

Company.	Stamps.	Tons Crushed.	Total Revenue.	Revenue per ton.
Geduld Proprietary	100	45,000	£89,943	40/ 0
Modder Deep Levels ...	70	44,000	125,103	56/10
Princess Estate	60	18,500	26,661	28/10
Totals	230	107,500	£241,707	—

	Costs.		Profit.	
Company.	Total.	Per Ton.	Total.	Per Ton
Geduld Proprietary ...	£51,056	22/ 8	£38,887	17/ 4
Modder Deep Levels ...	46,249	21/ 0	78,854	35/10
			£117,741	
Princess Estate	29,192	31/ 7	*2,531	2/ 9
Totals	£126,497	—	£115,210	—

* Loss.

The revenue derived from gold for the month has been calculated at £5 7s. 6d. per fine oz.

Albu Group.

The following information is supplied regarding the January operations of the producing mines of the General Mining group:—

Company	Tons Crushed.	Cost.	Cost per Ton.	Total Revenue.	Profit.
Aurora West ...	14,200	£17,451	24·57	£17,562	£111
Meyer & Charl.	13,000	17,161	26·40	45,215	28,054
New Goch ...	15,400	17,100	22·20	15,658	*1,443
Roodepoort Un.	22,700	26,139	23·02	27,766	1,627
Van Ryn Est...	34,600	35,315	20·41	45,998	10,683
West Rand Cn.	29,720	38,178	25·69	41,037	2,859
	129,620	£151,344	23·35	£193,236	£43,334
				Less loss	1,443
					£41,891

* Loss.

Working costs of all mines are increased by provision for additional allowances to employees recommended by Chamber of Mines in respect of the increased cost of living. In calculating the revenue, gold has been taken at a value of 107s. 6d. per fine oz., less estimated realisation charges. Shortage of native labour continues to affect the scale of operations on all mines, notably the Roodepoort United and West Rand Consolidated.

New Goch.—Expenditure on shaft sinking and development in the claims leased from the City Deep, which, formerly, was charged to a Suspense Account, is now debited to working costs. The amount included in the January costs is £2,685.

Crown Diamonds.

The secretaries write:—We beg to report that January operations resulted as follows: Number of loads washed, 9,427; total carats recovered, 777; rate of recovery per 100 loads, 8·24. The diamonds have been valued at £3,139, the largest stone being one of 16 carats. The average quality of the medium and small-sized stones has improved. Owing to heavy rains washing had to be suspended for the last four days of the month to allow the mine to be freed of flood water. The water supplies have, however, now been assured. The dam is full and overflowing, and it is estimated that we have ample supplies available for twelve months ahead. The actual number of working days for the month was 23, including four Saturdays. Owing to the necessity of extending the aerial gear anchorages in the mine and also to slight falls of reef, it was impossible to haul ground from all sections, so that the washing results obtained for the month cannot be said to actually represent the general run of the mine.

THE NATIONAL BANK
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J. EMRYS EVANS, C.M.G. - - Vice-Chairman.
P. DUNCAN, C.M.G., M.L.A. JAMES R. LEISK, C.M.G.
The Hon. ALBERT OLIFF, ERNEST OPPENHEIMER.
E. J. RENAUD, JAMES B. TAYLOR,
The Hon. Sir EDGAR WALTON, K.C.M.G., M.L.A.,
H. O'K. WEBBER,
General Manager: E. C. REYNOLDS.

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DIAMOND RETURNS FOR DECEMBER.

South-Western Transvaal Diggings.

THE returns from the various alluvial diamond diggings in the South-Western Transvaal for the month of December amounted to 7,233¼ carats, value £125,000, as against 7,644 carats, value £138,117 in November, and 5,050 carats, value £143,898, in October. The December returns are officially given as follows:

Name and No. of Farm.	Carats.	Value.	No. of Registered Claim Holders.
Blesbokfontein 63	1278¼	£20,383	340
Bloemhof 130...	264½	3,487	304
Bloemheuvel 171	32½	553	15
Cawood's Hope 79	3¾	24	8
Christiana	59½	809	51
Cyfergat 150	52¼	735	10
Diamantdoorns 131	3¼	23	1
Doornbult 153	28¾	387	1
Driekoppies...	1¾	36	1
Dievedraai 245	121¼	2,460	46
Eastleigh 593	56	983	45
Eerstebegin 290	35¼	630	1
Grootdoorns 333	39¾	636	1
Goudplaats 318...	6¼	154	1
Grootlaagte	6¼	30	1
Italie 12	173	2,555	8
Kafferpan 65	7½	88	5
Holloway's Rust 142...	42¾	849	4
Kromellenboog 108	10	154	7
Katdoornkraal 163	3¾	56	5
Koppiesvlei 54...	4½	15	4
Klipkuil 104	33¼	617	10
Kameelkuil 142	1039¼	19,885	362
Kareepan 137	517¼	10,223	164
London 33	123¼	2,912	118
Leeuwfontein 143	270¾	4,653	114
Mimosa 75	8¾	281	1
Mooifontein 128	40	767	2
Middelbosch 326	1	10	1
Maroetjesfontein 120	¾	5	1
Olivenfontein 376	12¼	150	1
Panfontein 121...	½	4	1
Rietput 120	3	60	1
Plessisdam 121	263¼	4,018	68
Rietkuil 138	1976½	33,291	422
Sandringham 25	11	110	1
Schaapboschdraai...	9	238	1
Schweizer-Reneke	81¾	1,403	13
Uitkyk	1¼	3	1
Vuurfontein 61	1¾	33	1
Vechtvallei 329	29	500	5
Zwartlaagte 68	579	10,990	1,128
Total	7,223¼	£125,200	3,275

PRETORIA.

Kameelfontein 106	1023	£6,657	247
Bynestpoort 520	688	5,557	255
Roodeplaats 314...	79¼	607	14
Kaalfontein 402	73¼	440	1
Rietfontein 501	65¼	355	1
Rooikoppies 209	3½	22½	1
Total	1,932¼	£13,638½	519

CAPE PROVINCE DIGGINGS.

The output of diamonds from the public diggings in the Cape Province during the month of December (the number of claimholders in Barkly West District being given as 2,023):—

BARKLY WEST DISTRICT (2,994 carats, value £54,370 7s. 6d.).

	Diggers.	Carats.	Value.
Bad Hope	3	19	£368
Delport's Hope	33	183½	3368
Forlorn Hope	4	6¼	60
Gong Gong	35	230¾	4380
Good Hope	90	364¾	4417
Grootkop	1	1	21
Harrisdale	30	179½	2715
Hebron	78	258¼	5285
Holpan	20	45½	742
Jonas Kopje	3	12½	219
Kareepan	49	236¾	5665
Keiskama	2	4¾	58
Klipdam	61	307¼	6554
Klipdrift	45	240¼	5404
Last Hope	5	35¼	664
Longlands	32	148¼	2367
Niekerk's Rush...	8	26½	380
Ricketts' Prospect	11	28½	613
Scholtz's Prospect	17	47½	729
Snyder's Rush	8	30½	647
Union Kopje	2	11¾	78
Van Zoelen's Laagte	6	10¼	170
Waldeck's Plant	50	287½	5031
Ward's Hope	7	71¼	851
Winter's Rush...	37	206¾	3579

HERBERT DISTRICT (807¾ carats, value £15,636 10s.).

Brypaal	20	51½	1172
Davisdrift...	3	15½	464
Mosesberg	96	543	9943
Platdrift	1	4	18
Schmidt's Drift	58	182½	3903
Sevonelles...	2	11¼	135

KIMBERLEY DISTRICT (85¼ carats, value £3,139 5s.).

Robinson's Kopje	4	31¾	1177
Wedberg	9	53½	1961

TAUNGS DISTRICT (1,018½ carats, value £20,441 12s. 6d.).

Home Rule	86	978½	19454
Killarney	8	40	987

PRIVATE ESTATES.

River View Diamond Syndicate	233¼	4759
Pniel Estate	80½	1315
New Vaal River D & E. Syndicate	719¾	13120

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Notice is hereby given that Share Certificates and Option Certificates can now be obtained in exchange for letters of allotment upon surrender thereof at the office of the Company.

By Order of the Board,

J. V. BLINKHORN,
Secretary.

General Mining Buildings,
Main Street (P.O. Box 1173).
Johannesburg, 12th February, 1920

THE JANUARY OUTPUT IN DETAIL.

Gold Premium's Effect on Profits—Increased Production and Profits—Improved Group Profits.

Total output	670,503 ozs.
Increase	20,312 ozs.
Value	£3,603,954
December value	£2,761,836
Witwatersrand	653,295 ozs.
Increase	21,462 ozs.
Value	£3,511,461
December value	£2,683,854
Outside districts	17,208 ozs.
Decrease	1,150 ozs.
Value	£92,493
December value	£77,982
Stamps	8,194
Increase	15

COMPANY RETURNS.

Owing to the fluctuations in the price of gold we give the returns for the different companies in ounces instead of in sterling. The outputs for last month were :—

	Ozs.	Increase.	Decrease.
Aurora West	3,277	—	145
Bantjes	53	—	26
Brakpan	20,601	974	—
City and Suburban	4,724	—	2,037
City Deep	23,828	624	—
Consolidated Langlaagte	11,903	419	—
Consolidated Main Reef	15,958	—	871
Crown Mines	52,953	3,603	—
Durban Roodepoort Deep	6,856	401	—
E.R.P.M.	33,111	—	2,581
Ferreira Deep	10,726	577	—
Geduld	16,648	702	—
Geldenhuis Deep	13,060	791	—
Government Areas	44,809	—	1,002
Jupiter	5,330	1,992	—
Knight Central	6,870	258	—
Knights Deep	15,111	1,179	—
Langlaagte Estate	9,472	319	—
Meyer and Charlton	8,459	—	390
Modder B	26,071	1,967	—
Modder Deep	23,393	278	—
New Goch	3,033	—	165
New Heriot	3,174	—	1
New Kleinfontein	14,983	—	245
New Modder	41,852	1,103	—
New Primrose	3,553	—	190
New Unified	2,921	195	—
Nourse Mines	13,335	1,194	—
Princess	4,963	282	—
Randfontein Central	40,408	4,312	—
Robinson Deep	16,060	194	—
Roodepoort United	5,155	65	—
Rose Deep	12,435	834	—
Simmer and Jack	10,767	—	151
Simmer Deep	9,631	3,707	—
Van Ryn	8,572	1,105	—
Van Ryn Deep	26,627	1,163	—
Village Deep	13,408	33	—
Village Main Reef	5,192	—	502
West Rand Consolidated	7,609	—	132
Witwatersrand	8,460	112	—
Wolhuter	8,381	—	129
Luipaardsvlei	3,519	335	—
Robinson	8,320	—	1,355
Springs	18,175	2,198	—
Wit. Deep	7,579	454	—
Miscellaneous	1,970	5	—
	653,295	31,375	9,913

OUTSIDE DISTRICTS.

Sub Nigel	5,356	34	—
Glynn's	1,308	199	—
Transvaal Gold Mining Estates	5,670	—	312
Barrett's	225	—	6
Miscellaneous	4,649	—	1,065
	17,208	233	1,383

GROUP PROFITS.

Central Mining	£478,259	£162,117	£256,309
Barnato	290,567	129,240	148,814
Union Corporation	115,210	66,070	71,443
Mines Selection	79,004	35,835	40,035
General Mining	43,334	14,334	18,557
Gold Fields	41,991	——	10,382
	£1,048,365	£407,560	£546,440

LABOUR FIGURES.

Number of natives employed on the last day of the month by the W.N.L.A. and contractors :—

On gold mines	176,390
On coal mines	12,766
On diamond mines	4,796
	193,952

Mr. D. Wilkinson, the newly-appointed consulting engineer to the Consolidated Gold Fields of S.A., has returned to the Rand.

Glynn's Lydenburg.

The following are the particulars of the output of Glynn's Lydenburg for the month of January:—Tons crushed, 3,300, yielding 1,270 fine ozs.; estimated value of month's output, £7,733; estimated profit for the month, £2,475. The above figures are arrived at by taking the value

American Export Trade.

According to latest reports from Washington, the report of the American Economic Association's Committee on foreign trade expresses the opinion that the United States must lend Europe money, even if for purely selfish reasons. The Committee, which has been studying the situation for ten months, includes Mr. Thomas W. Lamont, of the Morgan Co., Mr. Barton Hepburn, of the Chase National Bank, and Mr. Elisha Friedman, of the War Finance Corporation. The Committee dismisses the suggestion of an advance by the Government on the ground that sentiment is averse to further Government loans, and declares that private sources can be used through the Export Financing Provisions of the Edge Act, by the establishment of investment trusts to purchase foreign securities and the issue of obligations based on these securities, and the listing on American exchanges of foreign securities at present not included.

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THE WEEK IN THE SHAREMARKET.

More Hopeful Appearance—London Still Buying—Labour Position Easier.

THE market has assumed a more hopeful appearance since our last issue appeared. Gold has been fluctuating between 123s. 9d. and 127s. 6d., but even on the lower price this represents a premium of between 40 and 50 per cent. and an advance of 16s. 3d. on the rate upon which the highly satisfactory January returns were based. London is still a big bull of Kaffirs and the latest Home prices are as usual very substantially in excess of local quotations. The New Modder split shares are, for instance, about 14s. higher in London than they are here. The improved tenour of the local market is of course largely due to the fact that the negotiations between the Chamber of Mines and the executive of the S.A.I.F. promise an early and amicable settlement. Local ardour has, however, been severely damped by the restrictions placed by the Banks on credits for London account. This action has tended to greatly curtail the volume of business. For weeks past London has been taking large quantities of scrip off the local market, and the present inability to comply with orders has tended to depress prices. All the same, the local market is firm. The gold premium is likely to remain for a long time to come, native labour is somewhat more plentiful, and if a settlement is effected in regard to the long-threatened strike there is no reason why prices should not go better. Dividends are now being distributed and already a tendency to reinvest the Christmas boxes is in evidence. All the Far East Rand stocks are firm, but Modder B.'s at £8 and slightly under have not made up much leeway, and Modder Easts are weakish both for shares and options. Diamond stocks are quietly steady. Tins, despite the high price of the metal, are inactive, and oil shares are weak.

	Fri. 6th.	Sat. 7th.	Mon. 9th.	Tues. 10th.	Wed. 11th.	Thurs. 12th.
Anglo-Amer- Corp. . .	51 3	51 0	51 0*	50 6	48 4	50 6
Apex Mines	6 6*	6 9*	6 0*	7 0†	6 6*	6 9
Aurora Wests	—	—	—	—	—	5 9*
Bantjes Cons.	4 3*	4 0*	4 6	4 3	4 3	4 6
Brakpan Mines	74 0*	72 6*	78 0	78 0†	70 0*	76 6†
Breyten Collieries . .	8 0*	—	—	8 0*	—	—
Brick and Potteries .	—	4 6*	4 6*	4 6*	4 6*	4 6*
British South Africa.	—	—	22 6*	24 0†	—	23 0*
Bushveld Tins	1 10*	1 10	2 0	—	2 0	2 0
Cinderella Cons. . . .	6 0*	—	7 0†	7 0†	7 0†	7 0†
City and Suburbans .	8 0	8 0	8 0	8 6†	8 0	8 3†
City Deeps	66 0	66 0	67 6	67 0	66 6	67 6
Clydesdale Collieries .	25 0*	—	—	—	24 0*	—
Con. Investments . .	37 6†	36 0*	36 0*	40 0†	40 0†	—
Con. Langlaagtes . . .	24 9	24 9*	26 6	27 6	27 0†	25 9*
Con. Main Reefs . . .	14 6a	14 6*	15 0	15 0	15 0	15 3
Con. Mines Select. .	32 6	31 0*	32 0*	31 0*	31 0*	31 0*
Coronation Collieries.	—	—	—	70 0†	—	70 0†
Coronation Freeholds.	1 9*	2 0*	—	2 0*	2 0*	2 0
Conoration Syndicates	12 6*	—	16 0*	17 6†	14 0*	16 0†
Crown Diamonds . . .	12 0	11 9	12 0	11 9	11 6	12 0
Crown Mines	77 0	78 0*	81 6	80 0	78 0	81 0*
Crown Mines Debs.	£97*	£97*	—	—	—	£77*
Cuthbert's 6½ p. cent.	22 6†	22 3†	22 6†	22 0*	22 0*	—
Daggafontein Mines .	20 3*	20 6	20 3	21 0†	20 6	20 6†
Do. Opt. (4 years.)	0 6*	0 6*	0 6*	0 6*	0 7	0 7
Durban Rood. Deeps.		10 0*	10 0*	11 0†	—	—
East Rand Coals . .	2 6	—	—	2 6	2 1*	2 0*
East Rand Deeps . . .	1 1*	1 1*	1 1*	1 2*	1 0*	1 2
East Rand Props. . .	11 3	12 0	—	12 3	11 0	12 6
East Rand Debs. . . .	—	—	—	—	£70†	£70†
Eastern Golds . .	1 7†	—	1 5	—	—	—
Ferreira Deeps	12 0†	—	12 6†	—	—	—
Frank Smith Dmds.	7 2	7 0	7 2	7 0*	7 6†	6 9
Geduld Props.	55 0	56 0	58 6	56 6	55 6	55 6
Geldenhuis Deeps .	—	—	14 0*	—	—	—
Ginsbergs	—	—	—	—	—	2 9*
Glencairns	—	—	—	—	—	0 9*
Glencoe Collieries .	—	5 0*	—	5 0*	5 0*	5 3*
Glynn's Lydenburgs.	17 0*	18 0	18 6†	18 6†	—	18 6†
Govt. Areas . . .	97 0	98 6	99 6	98 0	96 9	98 3
Jhb. Bd. of Ex. .	35 0*	35 0*	35 0*	35 0*	[illegible] 0*	35 0*
Jupiters	6 3*	—	5 6*	5 6*	5 6*	—
Knight Centrals. . .	6 9*	6 9*	7 0	6 10	6 9	6 7
Knights Deeps	—	—	12 0	10 6*	—	10 6*
Lace Props.	15 0*	16 0	15 9*	15 6*	16 0	17 0†
Leeuwpoort Tins . .	30 0	29 6*	30 3	30 3*	29 6	29 0*
Lydenburg Farms . . .	7 6*	7 6*	7 6*	7 9	7 8	7 6*

	Fri. 6th.	Sat. 7th.	Mon. 9th.	Tues. 10th.	Wed. 11th.	Thurs. 12th.
Meyer and Charltons.	—	—	—	100 0†	98 0†	96 0*
Middelvlei Estates . .	2 0	—	2 0*	2 3†	—	2 0*
Modder B.s	160 0	159 0	160 0	158 6	158 0	159 6
Modder Deeps	53 0*	52 6	53 10½	53 6	52 6	53 6
Modder Easts . . .	27 7½	27 7½	28 0	27 3	27 0	27 3
Do. Opts (3 yrs.) .	7 3	7 0	7 6	6 11*	6 4	6 6
Do. Opts. (4 yrs.)	11 3	10 9	10 9	10 6	10 3	10 3
General Minings . . .	10 0†	—	10 0†	10 0†	—	—
Hume Pipes	23 0	—	22 0*	22 0*	22 0*	22 6†
Con. Gold Fields . .	—	—	—	42 6*	—	—
National Banks	295 0	295 0†	295 0†	293 4†	295 0†	295 0†
New Boksburgs . . .	—	—	—	2 0*	—	—
New Eland Diamonds	70 0*	70 0	72 6*	70 0*	75 0†	70 0*
New Era Cons. . . .	—	10 0*	10 0*	10 0*	10 0*	10 3*
New Geduld Deeps. .	2 2*	2 2*	2 3	2 3	2 3	2 2*
New Heriots	—	11 6†	11 0	10 6*	—	—
New Kleinfonteins .	14 6	14 6	15 6	15 6	14 9	15 6
New Modderfonteins .	83 0	82 6	85 0	84 9	83 0	85 6
New Primrose . . .	4 0*	—	—	3 6*	—	—
New Unifieds . . .	—	—	5 6†	—	—	—
Nigels.	7 6*	—	7 6*	—	—	7 0*
Nourse Mines . . .	—	14 0	15 6	15 6*	—	—
New States	30 6	31 0	31 6	30 3*	30 3	30 3
Pretoria Cements .	95 0	95 0	95 0	94 0	94 6	94 0
Princess Estates . . .	2 6	2 6*	—	2 9*	2 9*	2 9*
Rand Mines	—	—	85 0*	80 0*	—	—
Rand Nucleus . . .	2 0*	2 0*	—	2 0*	2 0*	2 6†
Rand Select Corp .	103 9*	103 9	104 0b	102 6	100 6	101 6
Randfontein Deeps .	7 3	7 0	6 9*	6 9*	6 9	6 9*
Randfontein Estates .	26 3	26 0	28 0	27 9	27 3*	27 6
Roberts Victors . .	15 9*	15 6*	—	17 0*	16 9*	16 6*
Rooibergs	10 6†	9 6*	9 9	9 0*	9 6	9 3*
Roodepoort Uniteds .	—	3 9*	4 0*	4 0*		6 0†
Rose Deeps	20 0*	20 0*	21 0*	—	—	—
Ryan Nigels	3 9*	4 2†	4 2†	4 2†	—	4 2†
Rouxville Diamonds .	24 6*	24 0	24 0*	24 0	23 6	23 6
South Van Ryns . .	8 0*	8 9	8 6	8 11	8 11	9 6
S.A. Townships . .	15 0	15 0	15 6	—	15 0*	15 0
S.A. Alkali	24 9	23 6*	23 0	25 0†	20 0*	20 0*
Shebas	—	3 0*	3 6*	3 6	3 6†	3 6†
Simmer Deeps	3 2*	3 3*	3 3*	3 3*	3 3*	—
S.A. Lands	6 2	6 1	6 1	6 1	6 0	6 1
Springs Mines . .	58 0	57 9	58 3	58 0	57 6	58 9
Sub-Nigels	17 9	18 0	18 9	18 9	18 0	18 6
Trans. G.M. Est. . .	17 0*	17 3*	18 0†	17 0*	16 6*	16 6*
Tudors	—	—	—	1 3*	—	—
Union 5 per cent. .	£104	£104†	£103¾*	£103½*	£103¾*	£104
Union 4½ per cent. .	£102½*	£102¼*	—	—	—	—
Union 5 p. c. tax . .	£102	£102†	£102†	£102†	£102½*	£102½†
Union Corp.		—	24 6*	24 0*	—	—
Van Ryn Deeps . . .	100 0	99 6	101 3	99 3	99 0	100 6
Village Deeps . . .	16 6	16 6	17 3	18 0†		16 6*
Village Main Reefs	8 0	6 0*	8 0*	8 0*	—	—
Van Dyks . . .	2 6*	—	—	3 0†	—	—
West Rand Cons. . .	8 0†	8 0†	8 0†	—	—	8 0
Western Rand Est. .	7 0*	7 0*	7 3*	7 3*	7 7½	—
Witwatersrands . . .	19 0*	21 3	21 6*	22 0	—	22 0†
Wit. Deeps	11 6	10 9*	11 0*	11 6*	11 6	11 0*
Wolhuters	5 3*	5 0*	5 3*	5 4½	5 4½	5 6
Victory Monarchs . .	59 6*	59 0*	59 0*	59 0*	59 0*	59 0*
West Springs	23 3*	23 0	23 9	23 0	22 6	22 6
Do. Options . . .	7 0*	6 6*	7 0*	7 0*	6 9*	7 3†
Zaaiplaats Tins . . .	11 0*	11 3	11 0*	11 0	10 6*	10 0

*Buyers. †Sellers. aOdd lots. bEx London.

Southern Van Ryn Developments.

The latest news from the Southern Van Ryn is to the effect that the reef developments in the shaft from the outcrop are most encouraging. In this connection, the cables this week state that the London financial papers, in their leaders, discuss the proposition for the extension of the Far East Rand, *apropos* of the lecture by Mr. Bleloch, who, according to the *Financial Times*, put his arguments in a more restrained manner than some of his recent utterances in South Africa. Mr. Bleloch has announced his intention of touring Britain with a view to interesting the British public in the southern extension of the Far East Rand. The newspapers welcome the statement by Mr. Bleloch that steps are being taken to open up the continuation of the Central Rand Main Reef series, south-east from the Cinderella Mine

THE BUYING PROGRAMME AND POLICY OF THE S.A. RAILWAYS.

A Year's Indents—Preference for S.A. Products—Points from Chief Storekeeper's Reports.

In the course of his annual report, the Chief Storekeeper of the S.A.R. writes: With the return of normal conditions it is hoped that the values of the stores stock on hand will be within the region of £1,750,000, although the more expeditious delivery of the 350 miles of permanent way material now coming forward will temporarily nullify the attempts to bring the value of the stores stock on hand to that figure. The approximate value of material indented for through the High Commissioner during April, 1918, to March, 1919, was £3,022,632, made up as follows: Rolling stock, £1,305,000; permanent way material, £984,531; materials for tarpaulins, £60,383; locomotive spares and tyres, £195,534; tin and metals, £5,762; carriage and wagon spares, £38,515; new machinery, £76,026; clothing, £3,101; catering, —; stationery, £7,636; signal and telegraph material, £17,444; harbour and lighthouse material, £4,258; vacuum brake gear, £9,400; steam heating gear, £450; bridge work, £26,201; drugs and medicine, £3,051; fencing material, £6,500; general, £278,870; total, £3,022,662. The following are prices paid during the years 1916, 1917 and 1918 for the items specified:—

	Average Prices		
Material.	1916.	1917.	1918.
Sal ammoniac, at per lb	£0 0 7½	£0 1 1	£0 1 2
Oil, raw linseed, at per gallon	0 3 2	0 8 9	0 12 10½
Oil, boiled linseed, at per gallon	0 4 1	0 8 9	0 13 6
Waste, cotton, at per lb.	0 0 4⅛	0 0 8½	0 0 9
Waste, woollen, at per lb.	0 0 5	0 0 10	0 1 2½
Copper, bar, at per lb.	0 3 1½	0 3 9	0 4 6
Tin, ingot, at per lb.	0 2 3	0 3 11	0 3 7½
White lead in oil, at per 100 lb.	3 5 0	5 0 0	4 10 0
Putty, at per lb.	0 0 3¾	0 0 5	0 0 8½
Mild steel plates, at per 100 lb.	1 6 0	3 0 0	3 14 0
Carbide, at per 100 lb.	2 5 0	3 15 0	3 10 0
Deals, 9in. by 3in., at per ft.	0 1 1½	0 1 4	0 1 5
Wire, fencing, at per 100 lb.	1 7 6	1 18 6	2 3 0
Bags, grain, new, at per each	0 0 9	0 1 0	0 1 4¼
Turpentine, at per case	1 16 0	2 0 0	2 8 0
Iron, galv., corrugated, at per ft.	0 0 9⅝	0 1 9	0 1 10
Iron, galv., plain, at per 100 lb.	1 14 0	5 6 3	4 0 0
Ridging, galvanised, at per 6 ft. length	0 7 6	0 12 6	0 9 6
Guttering, galvanised	0 2 3½	0 9 0	0 5 6
Piping, down	0 2 2	0 6 9	0 5 3
Mercury, at per 75 lb.	28 0 0	58 0 0	37 10 0
Shovels, round nose, at per dozen	1 18 0	2 15 0	4 0 0
Shovels, firemen's, at per dozen	2 2 0	4 4 0	4 10 0
Shovels, square mouth, at per dozen ...	2 15 0	3 12 0	5 8 0
Picks and beaters, at per dozen	2 5 0	3 0 0	4 4 0
Zinc, sheet, at per lb.	0 1 5	0 1 10	0 2 0
Sanitary paper, at per dozen 8 oz. rolls	0 7 6	0 10 3	0 11 0
Burners, No. 14, at per each	—	—	0 4 9
Iron, bar, imported, at per 100 lb.	1 13 6	2 10 0	2 10 0
Mild steel bar, imported, at per 100 lb.	1 5 11	2 18 9	2 5 0
Dynamite, at per case	1 5 9	1 8 0	1 16 6
Acid, sulphuric, at per ton	9 0 0	11 10 0	16 0 0

In common with other consumers in South Africa, the Administration experienced difficulties in obtaining adequate supplies of cement during the year. The policy of the Administration in fostering South African industries has been studiously followed wherever there was a hope of benefit ensuing. There is nothing new to record concerning this subject, but the following comments should be of interests: Leather: The quality of South African leather will have to improve, especially as to uniformity of standard, if the industry is to develop after post-War competition begins. Rope: South African manufactured rope from South African fibres has given satisfaction for many purposes. Shovel, Hammer and Pick Handles: These handles are still obtained from local manufacturers using local timbers. The manufacturers, however, have much to learn in the selection of suitable timber, or in the organisation which deals with that selection. Firebricks and Fireclay: The local articles maintain their position. Copper: Excellent results in foundry work resulted from the use of Katanga copper in the manufacture of gun metals. Pig-Iron: Satisfactory pig-iron of its class has been supplied by the Pretoria Iron Works, Ltd., and it is hoped this company may soon be able to supply all our requirements. Lead: South African lead has been successfully used for various purposes. Tiles: The scarcity of galvanised corrugated iron gave a considerable impetus to the manufacture of tiles, both burnt and asbestos cement. Lime: South African lime of high purity and of hydraulic properties is being consistently used, each in its special sphere.

Reclamation.—Reclamation of materials at the various stores depôts has been put on a sure basis, and there is much friendly rivalry to the end that the most should be done in this department of railway activity.

South African Steam Coal.—During year April, 1918, to March, 1919, 2,271,970 tons of steam coal were purchased for £566,575 8s. 11d. This coal has been procured: 1,742,997 tons Transvaal coal; 520,630 tons Natal coal; 8,343 tons Wankie coal. The average price per ton of 2,000 lb. was 4s. 11·85d., against 4s. 10·23d. for year 1917-18.

Permanent Way Material.—During the year supplies of rails and fastenings have been received from Australia and the Argentine, and a small consignment of 60 lb. rails with fastenings from the United States of America. An order has been placed with the United States Steel Products Company of New York for 200 miles of 80 lb. section B.S.S. type rails and fastenings, and 150 miles of 60 lb. section B.S.S. type rails and fastenings. The rails are to be open hearth basis (Siemens-Martin) or Bessemer acid, the former to be supplied in as large a percentage as possible. Approximately 7,500 tons of the 80 lb. section material is now on the water *en route* to Capetown and East London. Owing to shortage of stocks difficulty has been experienced in meeting the demands for permanent way material for open lines, but the receipt of supplies of new material under order will ease the position. Considerable quantities of points and crossings have been manufactured at Salt River, Uitenhage and Durban, although deliveries have not been so prompt as desirable owing to the pressure of work in the mechanical workshops.

Sleepers (Imported).—We have approximately 1,400,000 sleepers under order still to be delivered, principally from Western Australia. Great difficulty has been, and is still being, experienced in obtaining shipping to lift these sleepers, a large proportion of which is lying at West Australian ports.

Sleepers (South African).—In consequence of the exhaustion of the stock of creosote at the sleeper factory and the impossibility of obtaining further supplies from Europe, Australia, Japan or America, the supply of creosoted yellow-wood sleepers has been stopped. A large number of uncreosoted yellow-wood sleepers has been laid in the track owing to the general shortage of sleepers in South Africa. The delivery of uncreosoted sleepers to the sleeper factory through the depôts at Knysna and Storms River has greatly diminished owing to the woodcutters being able to obtain high prices for their timber for building and other purposes. The supply of sleepers cut from ironwood and other South African timbers has been inconsiderable during the year. Large supplies of sleepers have been offered to the Administration from various parts of the world, but the impossibility of obtaining shipping tonnage has precluded business resulting.

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EXAMINATION RESULTS.

MANAGERS' EXAMINATION held January, 1920.—We obtained no less than **NINE** passes from **ELEVEN** Entries.
This constitutes a percentage record for this Examination.

SURVEY EXAMINATION held November, 1919.—SIX of a total of **SEVEN** Passes were obtained by our Students. All other coached men failed to pass.

OVERSEERS' EXAMINATION.—We are **AHEAD** of all coaches with passes 1918 and 1919.

Write for particulars of our **up-to-date** Tuition.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

The Attack on the Nigel Board.

To the Editor, *S.A. Mining and Engineering Journal.*

Sir,—In your issue of the 17th January you gave conspicuous publicity to the circular issued by Mr. J. S. Sheldrick, a London agent of the Nigel G.M. Co., Ltd., to European shareholders. Although Mr. Sheldrick does not mention my Association by name, you supplied the omission by your headline, "Shareholders' Protection Association dealt with by the London Directors." It was the intention of the Association to reply forthwith to the circular, but the directors have been engaged in important correspondence with the Government on the subject of the Nigel Mine, and decided to await the upshot of that correspondence before making a public statement. Unfortunately, the Government, doubtless owing to the elections, has not been able to avoid delay, and it may become necessary for the Association to make a public statement without waiting for the conclusion of the correspondence. When this step is taken we trust that you will give the same conspicuous position to our reply as you gave to Mr. Sheldrick. Meanwhile the Association desires to repudiate the suggestion made in the circular that its activities have been inspired by "groups" who have recently secured large blocks of claims in the neighbourhood of the Nigel Mine. The criticism we have offered of the Nigel board is due solely to the action of the shareholders of the company.—Yours, etc.,

H. GAMBLE.

90-94 Exploration Buildings,
Commissioner Street, Johannesburg,
February 11th, 1920.

The Kalahari Scheme.

To the Editor, *S.A. Mining and Engineering Journal.*

Sir,—We are again indebted to Professor E. H. L. Schwarz for calling attention to the Kalahari problem, even if, from the engineering and practical point of view, his proposal offers insuperable difficulties. All that he says about the possibility of the fertilisation of the Kalahari is perfectly true, but for making it the "Egypt of South Africa" we need canals. We are not going to transport the water by the air to any great distance, and the cotton crop particularly needs regular and abundant irrigation.

Irrigation is not a failure, as Professor Schwarz, from an article in the "Geographical Journal," seems to make it out. It has, in the United States, not been the commercial success that it was expected to be, but this is simply due to the fact that there were no cheap fertilisers available, the irrigation water is not fully utilised by the crop, and the yield of the soil is not one-half of what it ought to be. It is also for this reason that the world is short of food.

Produce the fertilisers by the State, as William Willocks said already in 1904, and as now will be done in the U.S.A., in Japan and possibly even in England itself, the irrigation will, with white labour, be the same success as it is in India and in Egypt.

By fertilisation we do not only increase the crops, but we reduce the quantity of water required to much less than one-half. To give satisfaction to Professor Schwarz, the Irrigation Engineers may, even with cheap electrical power at their disposal, produce the artificial rains from the irrigation canals and all the objections against the irrigation with regard to salt and water-logging fall to pieces. In fact this is already done on an extensive scale.

If Kalahari shall be the Egypt of South Africa we require, therefore, first of all canals, principally if the cotton shall be produced on a larger scale sufficient to compete with the American supply to the Lancashire cotton industry. But there are over 2,000 miles of main canals in Egypt. Some of these are the greatest of the world and carry 25,000 cubic feet per second, or as much as our big rivers in flood. The Kalahari is a very much greater undertaking than Egypt. Although the enormous importance of the fertilisation of the Kalahari to South Africa climatically, economically and politically, is now in general fully recognised, we must not be deceived with regard to the cost, and, as this cost is considerable, every drop of water must be used for cultivation and not for a dead loss evaporation. The water will evaporate from the plants in an equal degree as from the lake, and the moisture of the atmosphere will be increased without establishing any swamps with malaria, sleeping sickness, etc., which make the country uninhabitable. The drainage of the existing swamps, including the 6,000 square miles of those of the Okavango, must, in fact, first be undertaken if a single white man shall be able to live there.

Although Professor Schwarz has not a great opposition amongst his fellow members of the scientifical profession of South Africa, I think he and the public can be fully assured that the Government is now perfectly aware of the importance of the Kalahari problem, and that a topographical and hydrographical investigation of the possibilities of the fertilisation of this country will be made before very long. But the Kalahari is not Union territory. The source of the Rivers to be utilised are in Portuguese Angola and in North Rhodesia. The Victoria Falls are in the hands of a private company, and the only part in the hands of the Union of South Africa is the gateway of these rivers through the Caprivi Belt and the south bank of the Cunene River. This is, therefore, an international affair and we know that such business requires for settlement the assistance of the Colonial and Foreign Offices in London, even for a simple investigation. This requires time, principally when these offices are, as at present, still occupied with the settlement of the Peace conditions. We must, therefore, be patient and this so necessary investigation will surely come.

There has lately been very much written and cabled about the cotton supply to the Lancashire industry and the different British Colonies and Dominions are encouraged to increase their cotton production in view of the possibility or even probability of a considerable decrease of the cotton export from the United States, as well as for a reduction of the price of the cotton which, of course, greatly affects the cost of living. The public in general has no idea of the enormity of this cotton industry.

		Lbs.
The normal British import of raw cotton as average of 1910-13, was ...		2,400,000,000
Of which, for Home consumption ...		2,050,000,000
Out of a total world's production of ...		10,500,000,000
The value of this import of 2,400,000,000 lbs. was, in 1914		£71,000,000
At present the value, at 27d. per lb., is ...		£250,000,000
Besides this import of raw cotton in 1913-14, were imported :—		
Cotton manufactures ...		£12,000,000
Cotton seed and oil cakes ...		£14,000,000
This industry occupies in England nearly 600,000 male and female workers, with an export of manufactured articles in 1914 of a value of ...		£103,000,000
The sources of the British cotton supply in 1915, were :—		
British Empire.		lbs.
Egypt ...		148,490,800
India ...		93,662,600
British East Africa and Uganda ...		12,042,300
British West Africa ...		2,291,300
British West Indies ...		2,014,300
Canada, Australia, New Zealand and others ...		8,418,100
		566,919,400
Foreign Countries.		
United States of America ...		2,022,385,900
Peru ...		38,412,000
Brazil ...		8,672,400
Chili ...		450,800
France, 1914 ...	1,978,600	
Turkey, 1914 ...	411,500	
German East Africa, 1914 ...	5,222,500	
Venezuela, Columbia, 1911, and others	363,200	
		10,775,600
		2,080,696,700
Total in all ...		2,647,616,100

MINE DEPT. EXAMS:—RECENT RESULTS.

Managers' and Overseers' Certificates (combined) 1917-19.
OUR SUCCESSES exceed the highest specific claims of any coaches by **100** per cent.

Managers' Certificates, 1917-19.
OUR SUCCESSES exceed the highest specific claims of any coaches by **400** per cent.

Overseers' Certificates.
OUR PASSES during the recent 6 months have been **95** per cent. **Only one of our candidates had to sit twice.**

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Thus the British Empire supplies only 21·4 per cent. of the whole British import.

The world's present production of 10,500,000,000 lbs. is approximately divided at 478 lbs. per bale.

Britsh Empire.	lbs.
British India	1,754,800,600
Egypt	643,900,000
Uganda	15,000,000
British East Africa	500,000
British West Africa	2,300,000
Soudan	8,500,000
Ex German East Africa	7,000,000
British West Indies	2,000,000
Nyassaland	3,100,000
South Africa	300,000
Canada, New Zealand, Australia and others, say ..	12,600,000
	2,450,000,000
Foreign Countries.	
United States of America	5,546,000,000
Brazil	143,400,000
Korea	24,600,000
Turkey, Mexico, Columbia, Venezuela, Bolivia, Peru, Chile, Porto Rico, French Colonies in Africa and Indies, Dutch India, Siam, Japan, China	2,336,000,000
	8,050,000,000
Total in all	10,500,000,000

Of which only 23·2 per cent. are produced by the British Empire, while the consumption of the industry of the British Empire is 36 per cent. of the world's production. Of the production of the United States, 60 per cent. are exported, and the United Kingdom takes, at present, 37 per cent. of the whole production of the U.S.A.

The population of the United States of America is, however, increasing, the industry and export of manufactured articles is expanding, the yield of the soil cannot be kept up without fertilisation, and all the other countries of Europe, except possibly France, must be supplied. The greatly increased production of cotton within the British Empire is, therefore, an urgent national necessity. Without this increased production the prices will not be reduced. But the replacing of the American export to the United Kingdom is an enormous affair. The area under cotton in the U.S.A. for 1915 was 31,500,000 acres, occupying more or less regularly 7,000,000 people, and paying per acre, at pre-War price, a revenue of £4 14s. Considering the cost of labour to be paid as well as fertilisers, this was a very small sum. With present wages the price will never go back to the old rate. The yield is not more than 169 lbs. per acre. At this rate we would require 2,700,000 people and 12,000,000 acres. Great efforts are being made in Egypt, in Soudan, in Uganda and East Africa, but the task is enormous

Both in India and in Egypt there is a limit to the cotton production. The land must first feed the great population, which is in Egypt 12,500,000 inhabitants for 6,000,000 acres cultivated land, on which the cattle must also feed. Recent cables say that the Delta could produce another 900,000 bales, an increase of 60 per cent. This cannot be done without cheap fertilisers which they have not got, neither without a wheat import, which may mean starvation by increased cost of living. The average yield per acre in Egypt is already 363 lbs. on 1,800,000 acres, one-third of the whole land, and the pre-War revenue per acre was £12 10s.—thus three times that of the United States—besides the winter crop. Some good soil gives 580 to 670 lbs. per acre, and one estate of Credit Foncien Egyptian, in the Delta, gives 892 lbs. per acre, besides a winter crop of 22 bags of wheat. This proves what can be done by irrigation and fertilisation.

Nigeria and Uganda are expected to give 50,000,000 lbs., and Soudan, on 1,000,000 acres, 300,000,000 lbs. This is still only 16 per cent. of the requirements to be able to replace the foreign import, and the question is where shall the rest be found? Shall we miss the opportunity to produce this cotton in South Africa by white men? With water and cheap fertilisers we can produce these 1,700,000,000 lbs. on 3,000,000 acres at 567 lbs. per acre, with 80,000 farms and 400,000 white inhabitants, and this is only one-half of what the Kalahari probably can do for one crop. The probable price may be reduced to the double of the pre-War price, or 15d. instead of 27d. per lb.

The value would be, with seed	£112,000,000
80,000 farmers must earn, at £200 per one crop	16,000,000
Native labour	5,000,000
Fertilisation	5,000,000
Other expenses, material or electrical ploughing	6,000,000
Total	£32,000,000
It remains profit	£80,000,000

or enough to pay the whole Kalahari scheme in one year.

The readers of the "S.A. Mining Journal" who have been kind to take interest in the Kalahari Scheme can now see for themselves that there is no visionary problem which I have tried to raise. Provided that we are able to produce the cheap fertilisers and cheap iron for rails and machinery outside of any private monopoly the Kalahari scheme is the certain salvation of South Africa's economical future, on condition, of course, that we are wise enough to maintain the British connection so that the Kalahari first of all can become Union territory, and secondly so that we have the British industry to take the product. This industry would, of course, otherwise take it somewhere else. No doubt that there would also be a large cotton manufacturing industry in South Africa. Is now the cotton industry in England so poor that they cannot raise the necessary capital for this undertaking, for giving employment to the white man rather than supplying the money to the equatorial colonies where all the labour will be done by the natives to the profit of the capitalists?

The reclamation of a desert is not considered so visionary either in the United States or in France, where in the heart of the Sahara in the old bed of the Niger a similar work to that of the Kalahari has been proposed since 10 years; but made impossible so far through the absence of communications.

My proposal of the Johannesburg-Walvis Bay and principally Cape-Gibraltar Railway has also been considered visionary and Utopian. It may therefore be of interest to show what the French proposals are in the North of Africa—nearly exclusively a black country. Their programme for more or less immediate execution includes, in addition to the existing 4,400 miles of Algeria and 1,300 miles of West Africa, a length of 19,000 miles of new lines, for which the expense is calculated at 4,500,000,000 francs at normal value £180,000,000. These 19,000 miles include as immediate requirement just the two lines Gibralter-Dakar, which will reduce the journey to London over Walvis Bay to 10 days and the line from Morocco to Lake Tshad. They even propose a second line over the Sahara from Tunis, both joining the narrow gauge Cape-Cairo express at Stanleyville. The programme includes also the line Tibeghin-Timbuctu through the future irrigated area of the Niger, and this line will take all the traffic from the English and French West Africa.

It is calculated that in 15 years the traffic will reach 20,000,000 tons, and this will include all the meat, timber, iron, coal that the French consumption or industry require.

In comparison with this scheme the South African part of it, or 2,000 miles in the Cape, Kalahari and Angola with an expense at £8,000 per mile of £16,000,000, is a very small affair. Daily we see how the aeroplane enthusiasts describe how they are going to bring the "new spirit" to South Africa by the air. We require badly this new spirit, but other means are required. The railway in six days to London must come to be able to bring 20 per cent. of the population to see the rest of the world and to judge of the activity that is required if a nation shall be able to exist.

I have the honour to be, sir, etc.,

A. KARLSON.

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TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Business Upset Through Labour Troubles—The Trend of Affairs—Timber and Building Materials—Bricks Acutely Scarce—Electrical Goods—Cost of Living and Prices on the Municipal Market—Banks' Restriction of Financial Facilities.

In the early part of the week business was much quieter on account of the overwhelming number of votes by the miners to strike, subject, however, to the right of their Executive to negotiate with the Chamber of Mines to modify some of the conditions, particularly in regard to the number of working hours. This proviso eased matters considerably as showing a loophole to obviate the drastic measures of a strike, but notwithstanding this merchants put off business that could wait until more daylight was discernible as to how it would all end. One of the labour leaders who was responsible for a public speech, remarked that there were a great many extremists, and that was one of the difficulties the Labour Executive had to avoid or smooth over. In the meantime merchants were buying from one another to complete orders in hand. Writing about mine orders reminds one of the fact that several dealers in maize are losing money over their mining contracts. Labour troubles are now part of one's existence, therefore the only thing to do is to keep a level head on the subject and work and hope for the best.

THE TREND OF AFFAIRS.

Some of the bioscopes and theatres have had petrol sets fixed as an auxiliary to the electric lighting in view of the possibilities of the stoppage of the Municipal power plant. It is also said that the idea has extended itself to Germiston and other places.

A big contract was recently placed for mining boots at a very fair price, to be made at the coast. During the War contracts were placed for mining material on a 10 per cent. profit on the landed cost in Johannesburg, but this plan, with the many phases of the American and other exchanges, has been gradually stopped, and merchants have to keep all the risks themselves. For example, tenders for shovels have been withdrawn when the exchange with America dropped so sharply. The original tenders were quoted at a price when the exchange was much higher. In this connection it must be remembered that a small difference in the exchange in our keenly cut prices on the Commercial Exchange is an important matter that merchants cannot ignore.

IRON, STEEL AND MACHINERY.

A consignment of machinery arriving now is costing about 300 per cent. over pre-War rates. There is a good demand for anvils and vises, which are difficult, nay almost impossible, to obtain from Britain and America. One merchant suggests that our own engineering shops should make some vises for sale locally. All kinds of wood working machinery are especially scarce through absorption by the furniture manufacturers, also Johannesburg has been drawn upon from all over the Union for wood turning lathes and other machinery. Business in bar iron and steel has fallen off considerably since the talk of the strikes, as people are only ordering from hand to mouth. Anything like purchasing for stock or speculation is in a state of suspense, although hardly anyone believes in the strike on account of the big premium on the price of raw gold—the only difficulty being in the hour question, which no doubt will be met in a liberal spirit, because when the wages are fixed up, it is expected that a give and take policy will prevail. According to cables steel plates have been waiting on the New York quay for two months for shipment to the Cape. Cables also say that the American makers cannot send iron and steel here for several months to come, as they are full up with orders. The latest price from London for bar iron is £25¾ per ton for the larger sizes, but it is difficult to obtain the smaller kinds. Johannesburg quotations are for imported mild steel 35s. 6d. to 40s. Tool steel 1s. 3d. to 1s. 6d. lb.; and solid drill steel 7½d.; ditto., hollow, 10d.; shafting, 7½d. to 8½d., according to size. Files have increased 10 per cent. during the last fortnight. Shovels have also recently advanced 5 per cent., being now 67s. 6d. to 72s. 6d. for American, but very scarce indeed; English at 85s. per dozen are fairly plentiful, but the miners will not pay such a difference in the price. Wheelbarrows are 70s. each in quantity, and 75s. for singles. There is a big scarcity in ¾in. bolts and nuts, therefore the values are stiffening. Steel plates are firming up again, at 45s., increasing in the smaller thicknesses. Wire nails, 50s. to 65s. per 100lbs.

TIMBER AND BUILDING MATERIALS.

There is no advance in values, but stocks are poor and there is not much Baltic timber on the water, therefore the tendency is for higher prices, especially in deals, which are in Johannesburg 1s. 10d. to 2s. per foot; floorings, 9¾d. to 10d.; ceilings, 6½d. to 7d.; and roofing iron, 1s. 6d. to 1s. 8d. for 24 gauge. Business throughout the building trade is excellent, but bricks are still very difficult to obtain for immediate delivery; a few recently came in from Boksburg, costing f.o.r. there 55s., and what with the railway charges and cartage cannot be delivered in Johannesburg on a job under 80s. per 1,000. The following circular letter has been issued by the Scotch Cart Owners' Association:—The Scotch Cart Owners' Association, at a special general meeting held on the 2nd February, passed a resolution increasing the present rates per Scotch cart load on all sand, metal, etc.; 1s. per Scotch cart load and 2s. per trolley load on quarry stone; 5s. per thousand on bricks from Kazerne, and 7s. 6d. per thousand from all brickyards; and Scotch cart for day work, to £1 per day. This further heavy increase the members are compelled to demand owing to the higher wages for employees and abnormal cost of feed for animals, 100 per cent. increase for licences for vehicles as demanded by Municipality, and the enhanced cost of all supplies for cartage maintenance and animal upkeep.

The second-hand timber yards are quiet, simply because they are bare of good stocks. There are plenty of enquiries, and prices are a secondary consideration providing suitable timber can be had. Second-hand roofing iron is practically unobtainable as no fresh lines are coming into the market.

ELECTRICAL GOODS.

Our forecast as to the probable rise in the price of lamps has now been realised, and during the past fortnight these have risen about 3s. to 4s. a dozen wholesale, with a strong probability (in view of the fact that the oversea quotations are about 20 per cent. above local prices) of still further advancing. Wiring and tubing are still very scarce, but supplies are expected shortly, which, however, cannot be said in respect of adaptors and ceiling roses, which are very scarce indeed. Switches are also getting scarce, and the price has risen from 15s. to 20s. to 18s. to 24s. Town and country business is satisfactory as regards orders, the trouble is to complete them in the absence of several essential features.

THE COST OF LIVING.

The writer has been closely watching the Municipal Market, where at times he finds news, for signs of relief since the drought of over six months was broken. This he felt was bound to tell with a little patience, as indications here and there are apparent already. For example, forage has gone down quite 2s. per 100 lbs.; lucerne also to a

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similar extent. Teff grass is lower, and as regards the inferior, a market review of Wednesday says that for many parcels of the inferior no fair bid could be obtained, presumably because the market was abundantly supplied with horse and cow forage. There were 600 bags of mealies on Tuesday's market, and prices were somewhat lower of about 1s. 6d. per bag; Kaffir corn was also 1s. 6d. easier. The market was filled with beans, but the demand was good, and prices were only slightly affected—but affected nevertheless. Tomatoes are still very cheap, and fruits generally are low priced excepting grapes. Now comes the question of butter, which was easier on Wednesday at 3s. 2d. to 3s. 3d. per lb. This, remember, is for good farm butter as apart from the Creameries, which has risen this week some 3d. to 6d. per lb. There is a reason for this, as the rains came later, and even now they are only partial in the Orange Free State and Natal. The farm butter is not so consistent in quality, and its keeping properties as the Creameries, but undoubtedly it has very much improved since the shortage of butter became acute. And suppose one gets a pound or so on the poor side, it can easily be purified with water and used for pastry. It is unwise to talk about butter going to 7s. 6d. per lb., and so make the cost of living appear too extravagant when we have our own farmers bringing 3,500 lbs. into the Johannesburg market in one day. Here again the Government might help by suspending the Dairy Act by allowing good wholesome margarine to come into the country and retailed at 2s. 6d. per lb. Not much cheese came to the market, but the best realised only 2s. 4d. per lb. Cabbages went as low as 2s. per bag; cauliflowers, 4s. New laid eggs started as low as 3s. doz.; and fresh at 1s. 5d. The last-named may not be over bright, but after a five years' war surely we ought to have a little patience and fortitude to make allowances and so economise. The next item is tobacco cut, at 4d. to 7½d. lb., and tobacco leaf, 11½d. lb.; and why are some tins marked up at 1s. 6d. a quarter of lb. That finished the market, and the verdict is a lowering tendency. Brandy comes on with a rise of 400 per cent. No one is compelled to buy brandy, as good Cape wines, beer, or even water they say are fine beverages. One also hears of ready-made suits at five guineas, and when inspecting shop windows very decent suits seem available at seven guineas. As regards boots a mining contract was put through at 22s. and 24s. this week from a coast firm, and South African boots can be had at 20s. and upwards, therefore if one wishes to economise, it can easily be done. Another bit of good news is that the banks will soon arrange to purchase letters of credit for export purposes at an increased rate of discount, and maybe pay out mostly in bank notes and not too much gold. They undoubtedly got caught, and so stopped discounting until the position could be reconsidered. All this may seem a terribly slow progress, but the big War is also the terrible cause. The best news in "The Star's" message from Capetown on Tuesday: The arrival yesterday of the steamer Surat with 77,164 sacks of Argentine wheat marks the beginning of a large inflow of foreign wheat into the Union, and should have a powerful effect towards realising the stocks of South African wheat now being held for higher prices by speculators and farmers. Another large cargo, consisting of 50,000 sacks is expected in a few days, and, like the first shipment, it will be distributed at the various ports from Capetown to Durban." Whilst trade does not want too much "spoon feeding" yet there are occasions when the Government can do a lot and this is one when the loaf is getting beyond the reach of many householders.

TEMPORARY STOPPAGE OF BANKING FACILITIES

On Wednesday morning a letter was read from the Banks by their clients, who have been in the habit of drawing on London on scrip drafts. It stated that facilities would be withdrawn, and this came into force on Wednesday, the 11th inst., causing much consternation in financial circles. Enquiries were made at two banks, but little could be ascertained, excepting that no doubt something would be fixed up during the week to discount scrip drafts, but at a higher rate of percentage.

The following has been contributed:—

Mr. Maurice Brown, iron and steel merchant, has just returned to Johannesburg, after visiting many of the manufacturers who have hitherto been supplying the South African market. He says he feels sure that in spite of all the weights hanging round the neck of England, she is slowly but surely struggling out of the depths. She will gradually overcome, one by one, the obstacles that have stood in her way, and providing labour is reasonable Great Britain will before very long reassume her premier position in commerce and industry and become stronger than ever. In his opinion and from recent experience whilst visiting manufacturing centres in England, young men, with progressive ideas, should be given responsible positions, after having studied the methods used in other countries. It is amazing to find men old in years and ideas as heads of works. In manufacturing centres such as Leicester, Birmingham, Sheffield, and Glasgow they have sufficient work in hand to keep them in full swing from one to three years. When he was in London, in December, it was almost impossible to obtain a quotation for any mining material or machinery, particularly iron and steel. Up to the great strike in America England was a large consumer of American iron and steel, and now that this is no longer possible the manufacturers are unable to produce anything like their pre-War output. As regards their raw material they are on very short rations, and the railway truck shortage is most acute. He had actually seen at rolling mills sidings stacked high with finished material, said to have been lying for months for want of trucks. Several works have had to close down on that account. The working costs in every class of trade are continually rising, so that the finished article which appears dear to-day would be quite cheap in a week or may be to-morrow. The general opinion in London amongst men who are intimately acquainted with industrial centres, is that higher prices will rule and material will be very scarce for some time. When France and Belgium are in a position to export then a little relief may be expected. In the meantime these countries are consuming the little they are able to produce. The Government leaders are impressing upon employer and employed to increase production, and therein lies the salvation. It seems to be the impression that given a fair year the end of 1920 should see the back of Great Britain's trials and troubles. As compared with the oversea quotations the prices at present ruling in South Africa are very low, but when fresh consignments arrive here it will be found that costs have increased considerably. It is therefore advisable to buy for future requirements while opportunity presents itself.

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Notes and News.

Native Unrest on the Mines.

Sporadic strikes of the passive resistance type have occurred among mine natives along the Reef during the week. These are all the more remarkable in view of the decision of the industry to increase native wages as from the beginning of the month. Steps are being taken to acquaint the natives with the extent and nature of the increases, and it is to be hoped that the trouble will not prove of long duration. The recent words of warning by Mr. H. M. Taberer, printed in these columns, have certainly come true sooner than expected.

* * * *

De Beers in New York.

Messrs. Lazard Brothers & Company, Ltd., of London, announce that Messrs. Lazard Frères are offering for public subscription in New York 80,000 American certificates of De Beers Consolidated Mines, Ltd., at the price of $47 per American certificate. These 80,000 American certificates are secured by the deposit with trustees of 32,000 De Beers Consolidated Mines, Ltd., deferred shares, the proportion being five of the American shares for two deferred shares.

* * * *

A New Copper Company.

The Mount Ayliff Syndicate, Ltd., has been registered in London with a nominal capital of £25,000 in 24,750 ordinary shares of £1 each and 5,000 management shares of 1s. each. The objects are: To acquire lands, mines, properties, and rights in South Africa or elsewhere, and to adopt an agreement with the Insizwa Copper and Cobalt Developing and Mining Co., Ltd. The ordinary shares take 80 per cent. of the distributed profits, but have no priority as to capital. The signatories are to appoint the first directors.

* * * *

The Mine Managers' Sphere.

A very interesting address on the problems of mine management was delivered by Mr. John Wessels, the outgoing President of the Association of Mine Managers, last week. Mr. Wessels covered a wide field in the course of his address, and made several valuable practical suggestions to promote efficiency and economy generally on the mines. His pleas for more research work, for closer interchange of experience and ideas, and for the co-operation of every section of employees in the industry, were both eloquent and opportune; and it is to be hoped that the incoming Council of the Association of Mine Managers will take practical steps during the year to turn these excellent counsels into practice.

* * * *

The Diamond Trade.

According to London advices, progress is still the dominant note in the diamond trade, and the description of conditions this week is "rosy." There is no slackening of the demand, so that it is almost superfluous to say that all goods offered for sale were readily taken. To the uninitiated the remark that demand exceeds supply conveys little or nothing; but conditions in the diamond trade are not on all-fours with those in other branches of industry. If Continental buyers cannot get the goods through their agents, or by post, they pay personal visits to London in order to use their own influence with the sellers. With the best will in the world the latter cannot satisfy every one at once. Quite a large number of cutters have been in London within the past few weeks, only to find their hopes still disappointed. The policy of restriction which the producers are pursuing seems to be aggravating the demand, and we hear of overseas buyers endeavouring to arrange regular contracts, and contracts which involve very substantial sums of money. It is suggested, too, that gambling in parcels of rough is again taking place. Brilliants, of course, sell quite as quickly as the raw goods, and there is a keen demand for the stones cut at Brighton, particularly on behalf of America, where, of course, the finest brilliants find a home.

The World's Deepest Mine.

In our technical notes we reproduce an interesting article contained in a recently issued bulletin of the United States Geological Survey on the subject of deep wells and shafts. The bulletin is incorrect in regard to the depths of shafts. It says the deepest mine in the world is shaft No. 3 of the Tamarack Mine in Houghton County, Michigan, which has reached a depth of 5,200 feet. We presume the Bulletin refers to metalliferous mines only. If this be so the deepest mine in the world is the Turf shaft of the Village Deep, Ltd. The vertical portion of this shaft intersects the reef at 4,300 feet and on the continuation of the banket beds the incline has been sunk a further 3,000 feet. The vertical depth from surface to the bottom of the incline is now 5,861 feet, so that the Village Deep Turf shaft is more than 600 feet deeper than the No. 3 of the Tamarack Mine. The Geological Survey is, too, apparently unaware of the depths of the Jupiter, Hercules and Cinderella Deep Mines. By the way, the Turf shaft is now down to sea level, and this fact is recommended to the notice of those who would like to get down to coast level in the space of a minute or two.

* * * *

The Postmasburg Diamond Prospects.

Particulars appeared in our issue of January 31 of the Postmasburg Diamond Prospect, Ltd., which has been floated by Mr. J. Dale Lace, to develop two promising diamondiferous prospects on the Postmasburg commonage. Since that date work has been actively carried on, and a yield of eight and a half carats has been obtained from a washing of 48 loads from the No. 1 mine. A very encouraging report on both prospects has lately been made by a well-known geologist and mining engineer. The nominal capital of the company is £50,000 in 50,000 shares of £1 each, of which 35,000 shares have been issued to the vendors for their rights, and 7,500 shares have been subscribed for at par by the promoter. The remaining shares are held in reserve, and are under option at par to the promoter for two years. It has now been decided to split up each £1 share into eight shares of 2s. 6d. each, and this should prove a popular step later on if and when the shares come on the open market.

* * * *

Western Rand Estates.

There appears to be some disappointment in regard to the projected re-opening of the Western Rand Estates properties on the South-west Rand. It has been expected that Mr. David Pullinger, who has been absent from South Africa since the days immediately following the Boer War, and who within the past few years has become prominently and successfully associated with mining enterprises in North and Central America, would be visiting the Rand in connection with the re-opening of the Gemsbokfontein shaft early this year. It is now reported that Mr. Pullinger's visit has been indefinitely postponed. We understand that a considerable sum of money has been secured in America for the re-opening of the property and the continued sinking of the shaft by means of the cementation process. Whether the money secured is sufficient to bring the mine to the productive stage or not is not known, but the present would appear to be an opportune time for the re-opening of the venture, and if the present opportunity of re-working the mine is lost it will be a pity, for there are certainly few more attractive mining propositions on the outliers of the Witwatersrand than this.

* * * *

Far East Rand Purchases and Changes.

The name of Rothschilds has frequently been associated with the Witwatersrand gold mining industry, and it has always been understood that this great European banking firm is in some degree identified with one of the premier corporations of South Africa. It may not, however, be generally known that Rothschilds have recently acquired a very extensive holding in one of the properties of the Far East Rand, a holding which we hear virtually secures for them control of this important gold producer. It is also of interest to hear rumours as to the likelihood of another important Far East Rand mine changing hands and to learn that it is quite on the tapis that the proposition in question will very likely be transferred to the control of another house in the near future.

The Late Senator Marks.

With deep regret we have to chronicle the death this week of Senator Samuel Marks, who had been ailing for some time, and who had reached the ripe age of 77 years. Senator Marks was one of the founders of, and partners in, the well-known firm of Messrs. Lewis & Marks, Ltd., and he was also a director of the many joint stock enterprises floated by that firm. For over fifty years, ever since the old Cape and Kimberley days, the late Senator was a prominent figure in financial circles, and his interests in the Transvaal were widely distributed in mines, land and industrial undertakings. A great part of the credit for the starting of the iron and steel industry at Vereeniging is due to him; and to his foresight and sound judgment is also due the present important position of that centre as a hive of industry. By his progressive tree-planting policy, the late Senator Marks set a beneficial example to the Transvaal, and, generally, it may be said that the country in him loses one of its most progressive pioneer captains of industry. The funeral took place at Pretoria on Thursday and was marked by widespread and general manifestations of regret from every section of the community.

* * * *

Messina and a New Copper Smelting Company.

For the year ended June 30 last the Messina (Transvaal) Development Co., Ltd., is in the unfortunate position of having to report a gross loss (after writing off £20,000 for depreciation of plant and machinery) of £39,400, against a profit of £14,300 for 1917-18. There was a further substantial decrease in the output of copper, partly no doubt owing to the shipping difficulties during the latter period of hostilities. An amount of over £46,000 has been allocated for debenture redemption and interest, and there is a credit balance of £48,057 to be carried forward, as compared with £133,770 brought in. The ore reserves have been further increased by 117,800 tons to 415,600 tons, but their average value has declined afresh from 3·45 to 3·26 per cent. copper. The general manager expects that in practice the grade will tend to go lower rather than higher, the exact assay value depending upon the market price for the metal. A company is being formed in South Africa (for which the Messina Co. will subscribe the bulk of the working capital) to carry on smelting and refining operations at the mine to produce refined copper to sell in this country and abroad. It is provided that the Messina Company will sell to the new concern all its concentrates on more favourable terms than are now obtainable elsewhere.

* * * *

Buying from Germany?

The interesting question was discussed in a recent issue regarding the possibility of buying mining machinery from Germany. It is generally assumed in the German Press that apart from the danger of an "economic war" on Germany, there is also what is termed a "psychological epidemic" with which entire nations are afflicted. This is resolving itself into an aversion for everything German, which will continue for some time to lead to a situation in all economic life similar to a state of war. To overcome this prejudice many suggestions have been made, some of which have been carried out. The first was the idea of selling German merchandise under the trade-marks of neutral countries. This, it is stated, has necessarily been abandoned. Another project is the establishment of branch factories in neutral countries. But here again, Switzerland, for example, has taken measures to prevent articles produced by such branch plants from bearing marks indicating Swiss manufacture. Such articles are not admitted to the Sample Fair at Basle, and it is anticipated that there will be future legislation, at least in France and England, to prevent the entrance of these pseudo-Swiss products. It is hoped, however, that it may be possible to overcome these difficulties by founding in neutral countries local (national) firms under the control of dummy directors. For the period immediately following the war, at least, it is urged that everything points to the neutral as the proper representative of German firms. He can enter France and England without difficulty, and can sell his customers German goods, which naturally speak for themselves.

TOPICS OF THE WEEK.

THE EXCHANGE AND CURRENCY PROBLEM.

The reception accorded to the pamphlet by Mr. H. Strakosch which was reviewed and extensively quoted from in our columns last week, has very naturally proved a trifle mixed. That, of course, is always the fate of the reformer. The Labour people, as is their wont, have read into it a deep plot to filch from them their "rights," as if an honest, public-spirited attempt to put our credit and currency on a sound basis could possibly be so construed. Some people who ought to know better profess to regard it as an *ex parte* plea for the mining industry; while this is offset by leading men connected with the gold mining industry regarding Mr. Strakosch's proposals as, in their ultimate effect, contrary to the interests of the industry. The week's discussion, therefore, tends to confirm us in the belief that the recommendations made in Mr. Strakosch's pamphlet provide us with quite the most attractive and scientific solution of our present currency and exchange problems that we have yet encountered. And here we may express our regret that our eulogy of Mr. Strakosch's services in the cause of British credit during the War should have embarrassed him by unduly magnifying them in dealing with his pamphlet last week. The fact remains that those of us who studied his views on currency questions could not fail to be impressed by the correctness of his reading of the signs at that time, and by the foresight which guided and informed his recommendations. At a moment like the present when every second man in the street has his own views on how the currency and exchange questions ought to be settled, it is obviously a real help to be able to apply some simple test to the value of the conflicting opinions offered. That test, in the case of the author under review, exists in the proved soundness of his past judgment. In the present case it is necessary in appraising their value to consider in their entirety the remedies advocated by Mr. Strakosch. Thus it is neither fair nor sufficient to say that his short and simple panacea for our present ills is to be found in the issue of Treasury Gold Certificates, as explained in these columns last week. That proposal has to be read with the recommendation to reform the banking system of the country, to which Mr. Strakosch devotes his final chapter. His treatment of this vast and all-important subject is printed fully in another part of this issue; and though he omits to say so plainly, we have reason to believe that Mr. Strakosch regards the need for the reform of the banking system as just as urgent as the other measure advocated by him. The crisis of the past few weeks has shown that though, economically, a young country compared with the United States and the European States, we have need for a scientifically-conceived, central reserve bank whose function and reason for existence would be to give stability and elasticity to our credit and currency system. The United States, we can all remember, were continually subject to violent financial crises that did more than anything else to hamper their progress till the establishment of the Federal Reserve System just before the War. Opinions may and do differ regarding the merits of that system—which was based on a study of European systems—but there is no question that the alternative to its creation, *i.e.*, the continuance of the bad old system of isolated, competitive banks, would have spelt financial chaos for the United States in the unprecedented conditions that obtained during the War. The application to South Africa of some such system is advocated by Mr. Strakosch, and he certainly makes out a good *prima facie* case for investigation. It must be admitted frankly that we have heard some cogent arguments advanced against Mr. Strakosch's proposals, and that he is still far from convincing the majority of those who are interested in the question. But he has at least made out an unanswerable case for enquiry, and we believe that Mr. Strakosch is on the right lines to put the credit of the country on an unassailable basis, however much, on closer enquiry, it may be expedient to modify his proposals. The main points are, that he has a sure grip of the fundamentals, that his lessons drawn from the experience of other and older countries cannot be controverted, and that his constructive and far-seeing proposals seem to constitute the most ambitious and attractive attempt yet made to solve, once and for all, our currency, exchange and correlated banking problems.

Robinson Deep Development.

At the Robinson Deep development in the lower levels continues to show a grade above the average of the present reserves, and it is especially satisfactory to find that the best widths and values recently exposed are those in the 3,700 feet and 3,800 feet levels in the vicinity of the Chris shaft, *i.e.*, at the lowest point at which work is progressing in the Booysens area. The progress made with certain development in the south-eastern section of the mine has considerably improved ventilation and will in the near future permit of the transfer to the Chris shaft of certain of the ore which is now being dealt with by the No. 1 shaft. Plans are under consideration for the sinking of one or more subsidiary shafts for the purpose of opening up the ground lying in the southern portion of the Booysens ground. The total loan indebtedness of this company at 31st December, 1919, was £394,600 and the reduction of the amount outstanding is receiving consideration. The average number of natives employed during the quarter was 3,662, against 3,858 for the previous quarter. The company's operations have been hampered to a rather greater extent than usual owing to the shortage of labour during the last quarter. The supply has, however, improved recently and it is to be hoped that it will continue to do so.

* * * *

Gaika Gold,

The report of the Gaika Gold Mining Company for the year ended 30th June last states that the net profit, after deducting depreciation, amounted to £13,625, less income-tax, £5,059, leaving £8,566; £1,620 was brought forward, making £10,186, out of which the directors recommend a dividend of 3 per cent., less income-tax, absorbing £8,205, leaving £1,981 to be carried forward. The further work carried out at depth in the south section has failed to prove the continuance to any material extent of the ore shoot opened up on the 5th level, where it was exposed for a length of 225 feet, averaging 19.4 dwts per ton over 70 inches. It was decided to reopen and do further work in No. 16 shaft, situated some distance to the north of the south section, and the result of these operations has been to expose in the south drive at the 3rd level, on what is known as the "Rubble reef," a shoot of ore which at the date of the issue of this report has been proved to extend for 120 feet, having an average assay value of 1 oz. 15½ dwts over 3 feet. A winze from the 3rd level in this rich section has, according to the last advice received, been sunk 45 feet, of an average assay value of 2 ozs. 8½ dwts. over 37 inches. At the 2nd level the drive north has so far opened up a section of ore averaging 1 oz. 12 dwts over 41 inches for a length of 100 feet. The ore reserves at 30th June last were estimated at 60,000 tons of an average assay value of 12.4 dwts per ton, which compares with 80,000 tons of an average assay value of 13.1 dwts at 30th June, 1918. This apparent reduction of 20,000 tons is partly accounted for by the deletion of 10,000 tons which it is considered are doubtful of recovery, the balance of 10,000 tons forming part of the ore treated during the year. During the year 36,789 tons were crushed, yielding 15,756.46 ozs. of gold of a value of £66,861. The working costs for the year were 26s. 3.69d. per ton, as compared with 29s. 10.79d., or a decrease of 3s. 7.10d. per ton, due in part to the smaller charge to working costs for development and partly to general economies in working. This reduction is gratifying, as the high prices of stores and materials so far show no tendency to decrease. Following the removal of restrictions on the export of gold, arrangements have been made for the disposal, jointly with the other Rhodesian gold mining companies, of this company's output as from July, 1919, in the best market, and it is anticipated that substantial benefit should be derived from this step

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THE GOLD PREMIUM AND ITS INFLUENCE ON DEVELOPING MINES.

Not an Unmixed Blessing—The Effect of Exchange on Plants—Ten Thousand Claims that will Soon Require Mills—A Paradox in Recovery Values—Why Developing Stocks are Weak.

Despite the influence of the gold premium which in addition to greatly augmenting profits and turning losses into gains has the effect of lengthening the lives of mines through increasing the value of low-grade ore, it is a fairly self-evident proposition that a number of the older Central Rand mines will exhaust their claim areas within the next few years. This indisputable fact is of enormous importance not only to South Africa but to the world at large, which is so dependent on the Witwatersrand for its supplies of gold—the precious metal upon which rates of exchange and barter are arbitrarily based.

The Passing of the Central Rand and the Extension of the Far East.

The obvious question arising out of these facts is simply this: "Can the areas now in course of development on the Far East Rand compensate for the loss of production which will be entailed through the closing down of the Central Rand propositions?" In considering the further expansion of the Far East Rand gold field, it must be remembered in the first place that, quite apart from the new propositions which are now being developed there, enormous scope for the extension of crushing operations at mines already producing exists. Springs, for instance, with its tremendous area of 3,567 claims could easily employ a mill of greater crushing capacity than 80 stamps. Government Areas, with 2,633 claims, is very modestly equipped with 180 stamps. Brakpan has 3,387 claims and utilises only 110 stamps. New Modderfontein, Modderfontein B., Van Ryn Deep and Geduld would each appear to be capable of employing substantially larger stamping capacities than are in commission at present. Further extension of crushing at these already producing properties depends of course on a number of factors, such as development, the available native labour supply and facilities and cost of further ore reduction machinery. It is obvious that very substantial expansion of operations is possible at these mines. But it is rather our intention here to deal briefly with the productive prospects of the four large developing concerns of the Far East Rand which in the years to come will have to take the place of the older and decaying mines of the Central section of the gold fields in the Chamber of Mines' list of producers.

A Quartet of Developing Mines.

The four concerns we have in mind are (1) the Modderfontein East, under Central Mining and Investment Company's control; (2) the New State Areas, of the Johannesburg Consolidated Investment Company; and (3 and 4) the West Springs and Daggafontein Mines, which are under the aegis of the Consolidated Mines Selection group. In the case of each of these companies a certain proportion of profits, depending on the extent of the area leased, the grade, and ratio of profits to recovery, is payable to the Government, so that the commencement of production at these mines will be directly beneficial to the country as well as indirectly so. The areas possessed by these four companies are as under: Daggafontein Mines, Ltd., 2,059 claims; New State Areas, 2,055 claims; West Springs, 2,236 claims; Modder East, between 2,250 and 2,450 claims. It will be seen from this that the total area involved in the operations of this quartet of developing concerns is between 8,000 and 9,000 claims, and at an average angle of dip of, say, five degrees this would give ore contents of about 5,360 tons of ore per claim for each foot of reef. On an average width of 3 ft. the contents per claim would be 15,000 tons, and if an allowance of 50 per cent. is made in respect of unpayable and faulted zones, a total tonnage of 127,500,000 is arrived at in respect of these areas.

An Immense Reserve of Gold.

If we further assume that each one of these payable tons contains one-third of an ounce of gold, it will be seen that the ultimate recoverable value from these mines is not less than 1,200 hundred millions sterling. Such a sum means a vast augmentation of the gold reserves of the world and of the prosperity of the mining industry. Shaft sinking is in progress at each of these mines and at three of them development is proceeding. The Modderfontein East has reached an advanced stage of development and will commence crushing operations at the leased Apex mill in a few weeks' time. But this is only a temporary measure, and the big point calling for consideration at the present moment is when conditions will admit of these concerns possessing their own batteries. The question is only of immediate importance in so far as developing mines are concerned, to the Modderfontein East, but one cannot refrain from speculating on the influence of this problem in regard to the other three mines mentioned in the foregoing.

The Cost of Mills.

By the time West Springs, New State Areas and Daggafontein Mines are in a position to crush, will industrial and exchange conditions oversea admit of these concerns purchasing the large plant they will then require at a reasonable cost? The prospects of establishing a successful iron and steel industry in this country are undeniably good, but it seems rather too much to expect that by the time these mines have completed their development programmes we shall be in a position to manufacture ore reduction and treatment equipments locally. As we have repeatedly stated in recent issues, preliminary estimates have demonstrated an almost staggering cost for the delivery and erection of a new battery and cyanide plant. England is gradually but slowly recovering her pre-War industrial and manufacturing position, but the costs of equipment such as is required by the Modder East are stupendous both in England and America. The adverse rate of exchange, which means a heavy premium on articles purchased in the United States, is a further factor to be reckoned with in dealings with Uncle Sam. In so far as Germany is concerned the outlook for obtaining plant from there is not attractive; it would seem to be almost better in France, since that long-suffering country is now again in possession of her lost provinces with their vast mineral resources. Certainly the outlook at present is by no means encouraging, in so far as the obtaining of large supplies of oversea plant is concerned. The question then asserts itself: Will equipments only be purchasable at a normal price by reason of a return to normal conditions. This latter circumstance implies that the favourable effect of the premium on gold which is now exerting such a beneficial influence on producing mines will have disappeared when the mines now developing are able to conclude negotiations for the purchase of ore reduction and treatment plant. This query has, too, a broader application in regard to mines at present producing, which could justifiably augment their milling capacities. And it has a further reference in respect of the other immense areas of the Far East Rand which have not yet even commenced development operations.

A Paradoxical Position.

The very conditions which have brought about a premium on gold have in fact created a state of affairs which is excessively detrimental to expansion of productive operations in the case of large mineral areas which cannot be economically worked without large crushing and treatment plants, and this factor in itself is calculated to curtail production from

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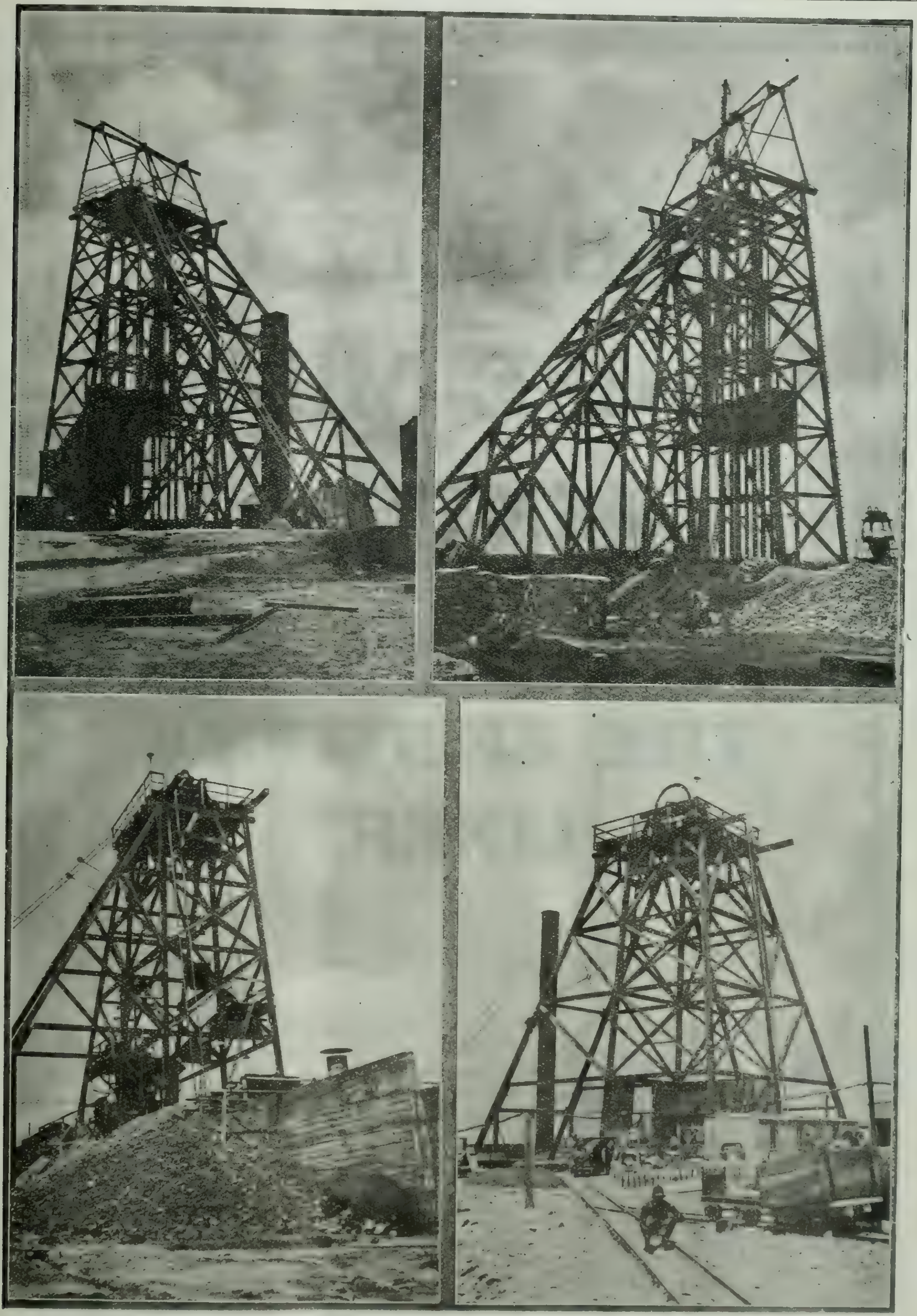

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the new Far East Rand areas and result in a restriction of output and therefore of an increasing demand and a non-increasing supply, in other words an augmentation of the premium. We do not attempt to point any solution of the problem, which is just one aspect of the tangled skein of finance and exchange which statesmen, bankers and merchants are now trying to straighten out. The questions raised in the foregoing are on all fours with the points raised by Mr. Strakosch in his valuable paper on currency questions, portions of which we dealt with at some length in our last issue. It may be recalled that Mr. Strakosch took the hypothetical case that the Government put up for tender another of the Rand mining areas, the equipment of which would cost £1,500,000, of which 80 per cent., or £1,200,000, would be spent in the Union for wages and products of the country, and suppose the exchange on London were at 150 per cent. In that case, it would cost the English capitalist £1,800,000 in his own currency to pay for the £1,200,000 which have to be spent in South Africa. He will reason—and rightly so—that by the time the lease area is equipped—in, say, six years' time—and he can expect a return on his investment, the United Kingdom currency will be back to the gold par—*i.e.*, on a parity with the Union currency. His investment would then have involved him in a clear loss of £600,000, by which his enterprise would be penalised through all its existence.

It is clear from Mr. Strakosch's valuable paper and also from the facts adduced in this article that the gold premium is not an unmixed blessing, particularly in its reference to mines which are in an advanced state of development and which require plant for productive operations. There are so many complexities in the whole subject that we have only touched on one aspect of the matter here, but it is apparent that whilst the gold premium acts in favour of the productive companies it is detrimental to the mines which have the erection of milling equipment in view. This has been reflected in recent market quotations, for whilst the shares of productive gold mines are very buoyant Far East Rand developing stocks have been decidedly weak of late and this despite the continuance of satisfactory development work.

THE YEAR WITH THE PREMIER (TRANSVAAL) DIAMOND MINING

THE report for the year to October 31 last states that the accounts disclose a working profit of £1,306,710. The stock of diamonds carried forward to the next year's account, represented by unsold diamonds, is only the small amount of £5,380, which amount remains in suspense pending realisation of the diamonds. After deducting the cost of equipment, £11,636, and allowing for a decrease in stores amounting to £15,906, represented by the difference between the value of the stores at October 31, 1918, which were written off as capital expenditure, and the value of stores at the close of this financial year, as well as £100,000 transferred to the trading fund, the balance is £1,210,980 available for distribution between the Government and the company. The appropriation account shows that the company's share was £484,392, and £27,066 was brought in, plus sundry revenue £46,679, making £558,137. Two preference dividends of 6s. 3d. per share were paid, absorbing £92,500, and on the deferred one of 6s. 3d. per share (£100,000), and one of 15s. per share (£240,000), absorbing £340,000; South African income tax, £24,696; Union Government dividend tax, £34,985; balance carried forward, £65,956. All dividends in respect of shares held by enemies have been paid to the Custodian of Enemy Property.

CONDITIONS REVIEWED.

The same conditions prevailed during the past year with regard to the disposal of the company's production as in the previous year, and the prices obtained for the diamonds show an advance on those obtained for the previous year. During the year the financial position has been such as to enable the board, after consultation with the Government, to place an additional amount of £100,000 to the credit of the trading fund, thus bringing this fund up to £400,000. Near the close of the period under review the financial position of the company was sound enough to enable the board to vote a special bonus to all employees whose names were on the books of the company at October 17 last. This absorbed some £47,000.

On the invitation of the Government a conference of the great producers of diamonds was held at Capetown in September and at Pretoria in October and November last, when it was agreed to control and limit the quantity of diamonds to be put upon the market by De Beers Consolidated Mines, Ltd., the New Jagersfontein Mining and Exploration Co., Ltd., this company and the producers in the South-West African Protectorate, and a very satisfactory contract was concluded for the sale of the diamonds of the named producers to the London Diamond Syndicate. The excellent results of this conference have every prospect of being of long duration, and will insure the diamond trade against material falls in the market value of diamonds.

THE GENERAL MANAGER'S REPORT.

The general manager's report states that the total number of loads of 16 cubic feet hauled from the mine was 4,623,090; the total production of diamonds was 814,577 carats; average yield per load, 0·180 carat; average cost (calculated on mine expenditure only, viz., £564,307) per load mined and washed, 2s. 5·902d.; per carat, 13s. 10·263d.; per load on total loads hauled, 2s. 5·295d. Owing to the influenza epidemic the first five months of the period were marked by a serious depletion in the native labour force to the extent of nearly 50 per cent. of the complement required for the ordinary work of the mine, in consequence of which operations were considerably restricted, reflecting a shortage of 276,590 loads in the quantity of ground washed, and a decrease in the production of 36,996 carats compared with the results for the previous year. The average cost per load mined and washed, 2s. 5·902d., shows an advance of 4·664d. on the figure for the preceding year.

Zaaiplaats Tin.

The Zaaiplaats results for the month of January are as follows: Mill ran 5 days; concentrating plant ran 24 days on accumulated product; concentrates won, 20 tons; estimated profit for the month, £1,112 9s. 7d.; capital expenditure, £205 15s. 1d.

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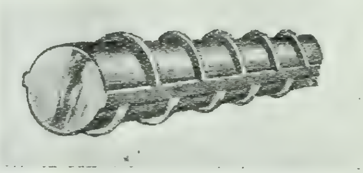

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TRANSVAAL SILVER AND BASE METALS.

Issue of Shares and Options -A very Encouraging Outlook—High Prices for Metals—Prospectors Busy—The Old Company and the New—The Application of the Elmore Process.

The shares and options of the recently-floated Transvaal Silver and Base Metal Mines, Ltd., have been issued to holders during the past week, and there is a general feeling of optimism in regard to the future of this venture. A forward policy of development is being embarked on and with silver at 84¾d. per ounce and lead at £50 per ton, it is small wonder that the outlook for the Transvaal Silver and Base Metals Company should be considered highly promising and that other syndicates and individuals should be busily engaged in prospecting potential argentiferous galena deposits in the vicinity. It is of much interest to note the operations and accounts of the old Transvaal Silver Mines, Ltd., and to observe the prices for the company's products which were obtained in the past. Silver, it will be noted, now sells at more than three times the price obtained by the old company whose assets have been acquired by the new, and lead is about six times higher.

Operations of the Old Company.

The Transvaal Silver Mines, Limited, was formed in 1889, with a capital of £160,000 in £1 shares, of which 146,700 were issued and fully paid up. The Directors were Lionel Phillips (Chairman), F. Eckstein (alternate H. A. Rogers), Geo. Farrar, S. W. Jameson, L. Lowenthal, and W. Ross.

The capital, originally £170,000, was reduced to £120,000 in 1890. It was increased to £160,000 in May, 1892, and 10,178 shares were subscribed for by the shareholders at 35s., while 22,422 were disposed of at 30s. The 32,600 shares thus produced £51,444, and 13,300 are still held in reserve.

The Company had a 99 years' lease of the mineral rights of the farm Dwarsfontein (with the exception of 700 acres of homestead rights), about 8,000 acres in extent. The farm is situated in the Pretoria district, about 40 miles from Pretoria, and 50 or 60 miles from Johannesburg. The work was mainly confined to two lodes the eastern and the western.

Accounts.—These were made up annually to December 31st, and submitted in March. During the year 1891, 538 tons of ore realized £7,783, and there was a net loss of £7,230. During 1892, 363 tons of bullion realized £7,400, and 427 tons of ore realized £6,466; and after including £18,844 received as premium on the issue of 32,600 shares, there was a net loss of £421. During 1893, 386 tons of bullion, 693 tons of ore, and 1,263 tons of concentrates realized £9,621, £8,828, and £9,787 respectively, or £28,236 altogether, and there was a net profit of £3,798, reducing the aggregate debit balance to £16,053. Balance-sheet items (December 31, 1893): Sundry creditors, £10,995; bills payable in London (drafts against concentrates shipped), £6,500; overdraft at bank, £7,271; debtors, £69; concentrates in transit and on hand, £11,289; bullion and ore, £623; due from Cape of Good Hope Bank, £767; cash, £517; and debit balance carried forward, £16,053.

We find it recorded that the Company at first adopted the plan of shipping to England its very high grade ore, then it treated the lower grade ore at its smelting works, and it was only on September 17th, 1893, that work with a concentration plant was commenced. The work done with this plant to the end of 1893 was equal to only 2½ months' full work, and during the period 5,972 tons of the ore gave 1,263 tons of concentrates of a total value (reckoning 72 per cent. of lead, at £9 8s. per ton, and 74 oz. of silver per ton, at 27½d. per oz.) of £9,787, or £7 15s. per ton. The cost of treatment (exclusive of mining) was £2,439, leaving a surplus of £7,347. Taking the more extended period of the five months to February 28th, 1894, 10,762 tons of ore gave 2,274 tons of concentrates of an estimated value (at £7 15s. per ton) of £17,623. The cost of concentrating was £4,488, leaving a surplus of £13,435. On August 5th, 1893, mining operations were suspended, there being sufficient ore opened up to keep the concentrating plant at work for some time, but when mining is resumed it is believed that the cost of mining and treatment will not exceed 20s. per ton of ore. Presuming that the 10,762 tons treated during the five months to February 28th, 1894, had been mined during the period at a cost of 13s. per ton, or £6,225 altogether, the working costs would have been £11,484, and the profit on working £6,132. The chairman had estimated that with the above prices for lead and silver, 2,400 tons of ore treated in each month would give £7,600; while the total cost of concentration, mining, and development, and of transport, freight, and realization would be £6,650, leaving £950 per month profit. With silver and lead above 27½d. and £9 8s. respectively, profits would of course increase. The cost of concentrating has been 8s. 4d. per ton of ore, and 39s. 5½d. per ton of concentrates; 4·732 tons of ore giving one ton of concentrates. At the end of 1893, 12,680 tons of ore were at grass, but much of the ore is poor. The Company has had to put up with transport difficulties, especially from June to September, but the Delagoa Bay Railway now runs within 16 miles of the property. As regards the net liabilities of £12,337 existing on December 31st, 1893, they were reduced to £7,037 two months later, and it was hoped that they would be extinguished altogether by the end of May, 1894.

The New Elmore Process.

In connection with the revival of the silver-lead industry in this country, particular interest attaches to the new Elmore process for the separation of silver and lead in their ores.

World Rights.

The patents for the world's rights for this process were secured by the Chemical and Metallurigical Corporation, Ltd., which carried out before the acquisition of these patent rights a very complete and exhaustive investigation to prove the commercial value of the process and to satisfy themselves as to the validity of the patents. This chemical invention ranks, in the judgment of many experts, next to the cyanide process and the oil separation process, the original invention of the Elmore Brothers, as probably one of the most important developments in metallurgical practice of recent times, and there is no question whatever that the field for its application is enormous, for the process separates by means of a very inexpensive plant with the cheapest chemicals the lead content and the silver content, the latter in a metallic form, from silver lead concentrates or ores such as are now being produced at the Broken Hill mines and at the Burma Corporation mines and in many other parts of the world, particularly America and Mexico. This process will revolutionise the existing methods in use for the separation of the lead and silver in this class of concentrates of ores, and at a cost which is a bagatelle compared to the values recovered, and saved for the benefit of the mine-owners as against any existing practice.

The Chemical and Metallurgical Corporation have sold their Western European rights to one of the most powerful metallurgical groups in France, who are now erecting a plant, the rights for Australasia, including Broken Hill Camp, have been sold to the Zinc Corporation and others, the South African rights, including the Rhodesian, have been optioned to the Central Mining Corporation. The Burma Corporation has secured an option to deal with the process as its own mine, and a contract is now being negotiated with that company for the purchase by the Chemical and Metallurgical Corporation of a large tonnage of their ores or concentrates for treatment in this country, and had secured the Santa Gertrudis Company and the rights for Mexico and Central America. A company is now being formed by the parties interested with the Camp Bird in the American, Canadian and British Columbian rights with a nominal capital of £400,000, to be provided with a working capital of £50,000, to be utilised to exploit the process in the United States of America and in the erection at Denver, under the direction of Mr. Cox, of a five tons per day unit to demonstrate the process in the United States of America. An exhaustive examination of the field for the application of this process is being made in the United States of America by an engineer well qualified to do the work, and the result of the information received to date indicates that the United States of America and British Columbia offer a large field for the application of the process.

This process may well have an important bearing on the future of the Transvaal Silver and Base Metals Company, and its future development will be watched with much interest.

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THE REFORM OF THE SOUTH AFRICAN CREDIT SYSTEM.

Need of a Central Reserve Bank—Lessons from U.S.A. and Other Countries—Plea for a Special Inquiry.

The diagnosis and remedy for the present state of the currency and exchange position in this country, contained in the pamphlet by Mr. H. Strakosch, from which we made copious extracts in our last issue, is rounded off and completed in the concluding chapter of that work, which is as follows:—

"A perusal of the Banking Laws of the Union, of which there are no less than four in number, cannot help but impress one with the desirability of their revision and unification. They are more or less antiquated and hardly adequate to meet the needs of a country whose agriculture, industries and commerce are rapidly growing. The country has reached a stage of economic development where special care is needed to overhaul and modernise its credit system so as to help forward its progress on sound lines and, at the same time, shield it from the ever-recurring excesses produced by the failings of human nature. Credit is a vital element in all healthy economic life and credit is based upon confidence. To secure an organisation of credit by which confidence is firmly established and credit maintained under all circumstances and conditions is the goal to be aimed at.

LESSONS FROM OVERSEAS.

No one can study the experience of the great commercial nations without being impressed by the high efficiency of their credit organisations. The work of the great central banking institutions in piloting them through prosperity and adversity is especially noteworthy. The experience of these countries, with their centuries of economic life, where every financial problem receives careful and intelligent consideration, and where vast financial transactions are constantly taking place, should certainly be suggestive and valuable to us. If we are to profit by their experience, the question of establishing a Central Reserve Bank for the Union should receive the closest attention.

INQUIRY RECOMMENDED.

It would be going far beyond the scope of these notes to attempt to examine the problem in its many bearings. The subject is vast, and it involves so many collateral questions which are intricate and complex that a special study by a set of highly skilled and experienced men is needed to decide what particular system is especially adapted to meet the needs of the Union.

U.S.A. EXAMPLE.

The study the writer has been able to give to the subject has led him to the conclusion that the system which will probably be found to be best suited to this country is one which in its fundamental principles follows that of the Federal Reserve System of the United States of America. Many of the cumbrous parts of the system which were introduced so as to meet the peculiar conditions of the American banking organisation and the country generally would naturally fall away and variations may have to be introduced to meet special conditions particular to this country.

It is broadly suggested that a Central Reserve Bank be established in the Union, the capital of which is to be provided from private funds, the Government having no interest in the shares of the bank. In view of the important functions which the bank will have to perform in sustaining the credit of the country, the Board should consist of a set of experienced men drawn from all sections of the economic life of the country. The appointment of the Governor and Deputy-Governor should, be subject to the approval of the Government.

A BANKERS' BANK.

Its business should be to act as the Banker of the Banks. It should not be, in any general sense, a competitor of the commercial banks. Their cash reserves would, to a large extent, be deposited with it, and only in times of emergency would it take an active part in the country's business. It would re-discount the bankable bills of the commercial banks in times of stress, and thus transform into a reserve an asset which otherwise has no value in this regard. To protect its own reserves, it would regulate the general tendency of discount and money rates and, by that means, influence the financial policy of the commercial banks and, through them, of the country generally.

MONOPOLY OF NOTE ISSUE.

It must have the monopoly of issuing bank notes. These should be covered by a minimum of 40 per cent. in specie or Treasury Gold Certificates and by 60 per cent. in genuine commercial Bills of Exchange of not more than 90 days' currency and bearing three signatures. These bank notes will take the place of the bank notes now current, and will be convertible into Treasury Gold Certificates. The liabilities of the Central Reserve Bank in respect of deposits should be covered by at least 35 per cent. in specie or Treasury Gold Certificates and by 65 per cent. in similar Bills of Exchange.

Provision should also be made for the commercial banks to maintain a minimum ratio of cash to liabilities of 15 per cent., a substantial proportion of which should be held as a deposit in the Central Reserve Bank.

The Federal Reserve System of America has been modelled, to a very considerable extent, on the lines of the old-established systems of the principal continental countries of Europe, and has stood the test of adversity by successfully seeing the country through the difficult times of the great War. It is doubtful whether a better model can be found.

Barrett Gold Mining.

The report to February 28th last states that the year's operations resulted in a loss of £4,131, increasing the debit balance of profit and loss account to £17,865. The tonnage mined and treated at the respective works was 35,762, a decrease of 388 tons as compared with the previous year. The average value of the ore was 1.88 dwt., of which 80.45 per cent. was recovered, equal to 1.506 dwt. per ton. The total yield of gold was 2,711.92 oz., valued at £11,322, after allowing for realisation charges. For many years the prospecting and development have been regulated not by the requirements of the mine, but by the margin of funds available from the monthly output. The property therefore has not had justice done it, and during the War all that could be done was to carry on. So long as the loss on working was smaller than the standing charges, it was more economical to keep going than to close down, but recently the monthly runs have been very poor and the losses considerable. The board has therefore decided to close down until sufficient capital is provided to thoroughly prove the rest of the ground: the only other alternative—and this the directors are anxious to avoid being to liquidate the company and realise the remaining assets. The financial position was fully explained in the circular of May 4, 1918, and also by the Chairman at the last annual meeting. In the absence of an adequate response by the shareholders (the amount of loans offered being less than the minimum specified in the circular), no allotment was made. Since the close of the financial year the board has succeeded in arranging a loan of £5,500 on mortagage of the company's movable and immovable property in South Africa at 7½ per cent., and this has enabled them to pay off the overdraft with the company's bankers, but insufficient to discharge all the loans made by the directors. In order to pay off the mortgage and provide funds for prospecting, etc., the board are of opinion that further capital amounting to not less than £20,000 should be raised, and they consider that the market conditions are such at the present time that the opportunity now afforded should be taken advantage of and an endeavour made to raise the capital on reasonable terms. The board are of opinion that this can be most economically effected by an issue of preference shares. It is suggested 40,000 shares of 10s. each should be issued, entitled to a cumulative dividend at the rate of 10 per cent. per annum, with further participation in the surplus profits after the holders of the ordinary shares have received 10 per cent. per annum; that these shares should be offered to existing shareholders in the proportion of one preference share for every six ordinary shares held, and provision made by the necessary alteration in the articles of association that no debentures can be issued by the company without the consent of say two-thirds of the holders of these new shares at a meeting specially convened for that purpose. The alternative would be to issue debentures carrying interest at the rate of say 7 per cent., which would rank as a first charge on payment off of the present mortgage. If the board's proposal to raise the new capital is endorsed by the shareholders the directors would ask for a free hand to give effect to either alternative or indeed to any other method that may be found most advantageous. In the event of an issue of preference capital being determined on shareholders' sanction will be necessary and the directors' proposals will be submitted in due course.

MINE MANAGERS AND RAND PROBLEMS.

A Review of White Labour Questions—The New Conditions—Need for Research and a Plea for Co-operation—Points from President's Valedictory Address—Sir Evelyn Wallers on Extremists.

The retiring President (Mr. J. J. Wessels) of the Transvaal Mine Managers' Association, delivered his valedictory address at the annual meeting of the Association at the Chamber of Mines last week.

Referring to labour unrest, Mr. Wessels said that in this corner of the world of industry they had found the stirring and the disturbances of old thoughts and habits a very real thing, and its manifestations had kept them in a constant anxiety that would have seemed unbearable and unthinkable a few short years ago. Nor had the process of change itself been merely in the nature of an ordered progressive advance. Instead, there had been a series of violent jerks forward, a succession of spasmodic moves, out of which they had to evolve, as best they could, some good, some gain, lest the net result be retrograde and reactionary. As engineers, it was up to them to guide these great world forces operating in their midst so that they did not destroy themselves by subverting industry and making its last state worse than its first.

On the whole he thought they could claim to have come through this year of transition not without credit to themselves. And in saying this he felt it only fair to put on record here their appreciation of the work of the Chamber of Mines, through its leader and spokesman, Sir Evelyn Wallers. The spirit and the policy of the Chamber and of its president had not pleased all the people who had to carry out that policy all the time, but he submitted that the policy had justified itself

SHOP STEWARDS.

Referring to the recommendations of the Low Grade Mines Commission dealing with the appointment of shop stewards, which was an innovation in the Rand industry, the speaker remarked that he did not say that the case for the general application of the recommendation was entirely proved, but he did say that they, as engineers, should give the matter their serious study and consideration, and if they were satisfied of its merits, there should be no hesitation in putting it into general effect.

Emphasising the necessity of research in the field of mining engineering, the study of the jack-hammer as an example, he said it was enough that the way to a possible saving was indicated, and that this might be but one of the several ways in which they might be able to economise in the all-important direction of labour. Such results could only be obtained by the general co-operation of them all, by a free interchange of experiences and ideas, and by the practical application to their profession of the motto: "One for all, all for one."

An appeal for co-operation, he thought, might profitably be extended to all classes of employe in this industry. For the time being—for how long they did not know—the position had been saved by the welcome premium on gold, but everywhere Governments were striving to get things back to the normal, and the time might come sooner than most of them expected when the adventitious and most helpful aid to the industry furnished by this premium might be considerably reduced, if not withdrawn altogether. "When that time comes," he added, "it will need all our efforts to keep the industry running at full swing, and to that end every man employed on the mines in whatever capacity must co-operate loyally and whole-heartedly.

NOT MERELY ECONOMIC.

"I am one of those who believe that the employe is something more than the mere 'economic man.' I believe more can be done by putting the facts fully and fairly to the men, in a word, by taking them into our confidence, than by bullying or abusing them. If we can keep our men informed of the vicissitudes of the market for our product, if we can convince them of the instability that is inherent in all such markets for rare and precious metals, notably, in that for gold—we may reasonably expect that when the inevitable set-back does come to our present temporarily fortunate position in this respect, they will rise to the occasion and help us, if only in their own interests, to save the industry from the resulting restriction."

Mr. P. Cazalet seconded the motion for the adoption of the report and balance sheets. Speaking of the necessity of research, he could think of few, if any, industries to which that could be so well applied as mining. Much of the underground work was done by rule of thumb. To a small extent research work was being carried on on the Rand, and very efficiently, and he hoped this would be extended until they really knew the time and expenditure of energy and labour and everything else in all vital operations underground.

Mr. J. Whitehouse was elected president for the year and Mr. H. R. Hill vice-president.

Sir Evelyn Wallers, in a brief speech, referred to the fact that the complexity of industry was greater now than it had ever been before, and to the greater realisation of that complexity, adding that a very large proportion of what was known as the "profession" of employers was that portion which was concerned with the management and adjustment and treatment of the workmen with whom they were associated. Quoting the Chairman's remarks as to agreeing with the policy of the industry, Sir Evelyn remarked, "I must say I agree with you"—(laughter)—and he proceeded that if they contemplated what would have been the alternative, he thought they would agree more than ever as to the success of that policy.

"There are two sets of people in any industry on the industrial situation," said Sir Evelyn, "who can make hay of it. One set consists of extremists on the employing side, the gentleman who always refers to firmness as a particular virtue—in its academic sense as a rule—and who gives indication that he is not prepared to carry out agreements which are considered fair. I do not say we have these people, but these are the people who can cause trouble. The other set is among the workers who refer to employers and the Chamber of Mines as those who buy and sell labour as a commodity, or as cattle are bought and sold.

"These two sections of opinion are the sections that we want—we moderate people—to submerge. On the part of ourselves, we want to submerge any extreme opinion amongst ourselves; and on the part of the workers they want to submerge in their own counsels the extreme and dangerous opinions which are sometimes given voice to.

"These two sets of people are comparatively small. They are sometimes extremely articulate, but they are small and there is not a great deal of difficulty in submerging them."

The position throughout the year had been difficult, Sir Evelyn concluded. There had been a great many problems to settle, but the fact remained that substantive wages and conditions in this industry were recognised by the people who worked under them as being on fair and sound grounds. It might be that there were improvements in some directions still to attain—in fact it would be strange if it were otherwise—but on general lines he felt sure the workmen realised on these fields that they were fair and reasonable conditions. Difficulties from the increased cost of living were difficulties which the industry had hitherto met, and the difficulties to-day were such that, by virtue of the evidence of the gold premium, they were also able to meet.

"If it were not for the gold premium," added the speaker, "they could not be met, and the problem would be much more acute in the direction of unemployment. At the present time, however, we have temporarily the wherewithal to meet the increased cost of living, and therefore in ordinary fairness the increased cost of living will be met."

In conclusion, he remarked that his hearers had also had their difficulties, and they perhaps arose from the fact that the workmen and trade unions with their sense of strength at times outran their sense of responsibility, but he thought they could look to the lessening of that as time went on, till it disappeared altogether

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A REVIEW OF IRON AND STEEL MAKING IN THE UNION.

Past Failures—Some Successful Enterprises—The Newcastle Industry—Vereeniging, Pretoria, Dunswart Undertakings

THAT iron and steel to-day are more important than any other metals was shown during the late War, for the country that had the greatest steel-producing capacity came out on top; and it was not until the Allies increased their iron and steel making capacity to that of Germany that they forged ahead. Of the leading British possessions, Canada, India, Australasia and South Africa, the last is the most backward in this respect.

A RETROSPECT.

The first attempt in South Africa to produce pig iron from local ores was at Sweetwaters, near Maritzburg, by a very small furnace. A small quantity of pig iron was produced, but the plant was far too small to work on a commercial basis, and after a few months closed down. Within the last two years, two companies were formed in the Transvaal to erect experimental plants to try out the local ores. Both, so far as producing pig iron is concerned, were a success, as some iron of good quality was produced by both, but the furnaces were only capable of producing about 7 tons per 24 hours, so that these plants were also too small to work on a commercial basis.

THE NEWCASTLE BLAST FURNACE.

There is now being erected a blast furnace at Newcastle, Natal, with a capacity of 120 tons per day. It was designed by Messrs. McClure & Son, of Pittsburg, U.S.A., and is being built by Mr. S. Poole, late of Lithgow, New South Wales, where he built Australia's first modern furnace in 1906, under Mr. P. G. Pennymore, who was manager of the Lithgow Works at that period. The furnace paid so well that the firm later built a second and larger furnace, which now produces 2,500 tons per week, all of which is consumed in the Commonwealth. Australia made its first attempts at producing pig iron in 1848, and later in 1865. The furnace was rebuilt and was producing 60 tons per week at £5 17s. 6d. per ton, but it only ran a few years as they had no protection against large foreign plants. The iron being carried as ballast, South Africa in many respects resembles Australia, only that we are about 14 years behind them in our first modern plant.

THE KEMPTON PARK EQUIPMENT.

In the manufacture of iron and steel bars, the first company formed was called the Transvaal Iron and Steel Co., with a capital of about £50,000. That was in 1905. They erected buildings on a site at Kempton Park, some 18 miles from Johannesburg, where a 10 in. guide mill and an 18 in. mill were partly erected. These mills were purchased in New Zealand and were second-hand. This company never got to the producing stage, and in 1914 was liquidated and the mills sold as scrap.

A SUCCESSFUL ENTERPRISE.

In 1911 Messrs. Cartwright and Eaton formed a private company of £10,000 capital, taking in with them Messrs. Grubin, H. A. Neame and Bromley Kemp. They registered as Cartwright & Eaton, Ltd., and erected a 12 in. Merchant guide mill, two furnaces for mill, and three pile or ball furnaces and steam hammer. Mr. J. K. Eaton, being joint managing director, erected and managed the plant for the first two years. He secured iron workers, under contract, from Scotland. Late in 1913 the company engaged Mr. Deacon from England to manage the works. Later, the capital was increased to £25,000 and the company registered as the Dunswart Iron and Steel Works. These works have had a steady growth right from the beginning, and have been most successful. They also have an 8 in. guide mill at work and an 18 in. mill on order. The last balance sheet of this company showed profits for the year of £33,050; income and excess profits tax, approximately £34,000; brought forward, £10,706; available, £43,756; dividends, £30,140; carried forward, £13,616.

VEREENIGING SUCCESS.

In 1913 the Union Steel Corporation commenced operations at Vereeniging with a 12 in. Merchant guide mill, Siemens gas fired mill furnaces, and a 12 ton new form Siemens open hearth steel furnace. This was the first successful steel melting furnace in South Africa. The steel was cast in ingot moulds and forged down under a Davey high-speed steam-hydraulic press of 600 tons capacity, and then rolled into merchant bars, angles and light rails. Later a 20 ton open hearth steel furnace was erected and a 15 in. Merchant mill and a 22 in. 3-high cogging mill. All these mills are electrically driven. There is also a Heroult electric furnace at work. These works have been doing well since the War, working on scrap iron, except the small amount of pig iron which they purchased from the Transvaal Blast Furnace Company. The late Mr. H. Wright, in conjunction with Messrs. Lewis & Marks, founded these works.

UNSUCCESSFUL STEEL MAKING.

The first serious attempt to make steel in the Transvaal was by a syndicate who erected a small open hearth steel furnace and buildings at Denver about the year 1906. The hearth of the furnace was built on a six-wheel truck and was to be pulled out from under the crown and the contents poured into a ladel and then into moulds for battery shoes and dies. The furnace was badly designed and it was quite evident the management was in the hands of amateurs, for they were unable to pour their first charge, and it lay there for some years.

THE POSITION AT PRETORIA.

The position at the Pretoria iron works is that the capital of £1,500,000 necessary to equip the works with steel converters is being arranged for by one of the big financial institutions, and that public participation both in Great Britain and South Africa may later on be invited. An effort is being made to secure the co-operation of all the firms interested in iron and steel making in the country, and manifestly it is eminently desirable that all concerned should unite to make the undertaking a success.

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THE MINERAL RESOURCES OF NATAL.—II.

[By J. Forsyth Ingram.]

Although Dr. Hatch's report, to which reference was made in my first article on the mineral resources of Natal and Zululand, is extremely valuable from a geological point of view, it must not be overlooked that it was somewhat hurriedly prepared, and that at a time when a number of mining ventures, conducted by inexperienced men, for the most part, who by their mismanagement of the limited capital and opportunity at their disposal, were on the point of failure. It is therefore little to be wondered at that the report was non-committal. At that time no attempt was made to recover the refractory gold in *a region composed entirely of refractory rock*. While even in handling the free gold, the methods were so primitive and careless as to create loss in every possible direction. Dr. Hatch, from the data at his disposal, was perfectly right in his deductions, to the effect that so far as he had seen there were no gilt-edged mining propositions (outside that of coal) to be found in Natal or Zululand; yet he qualified this remark by his statement on page 46 of his published report, when he said: "On the other hand, having regard to the large areas of schist in Zululand, and of schists and quartzites in the Pongolo Valley, Vryheid district, *most of which remain unprospected*, it can hardly be doubted that, besides the occurrences already known, further gold quartz veins will be discovered, with ore shoots and bunches that would probably repay development. Even if the bunches of payable gold should be small, success may be achieved, provided the mines are not overburdened with capital, and are worked with strict regard to economy. Rhodesia is a shining example of what can be done on small propositions by individual workers." The writer might well have added by small companies provided they were under the management of capable men.

It is not only in gold or copper, silver or lead, that Natal's true mineral wealth lies. Hidden within the embrace of her verdant hills, are millions of tons of asbestos, a commodity that at the present time is a treasure in very deed. Did space permit, I could adduce facts in connection with it that would justify those who delve for treasure in the earth, to devote all possible energy to the development of the deposits already known. Time was when men regarded lengths of anything from two feet to six as the only description of this product that was worth working. Nowadays half-inch lengths are well worth attention. The Commissioner of Mines in Maritzburg has in his most interesting collection of minerals specimens of the wool worked up from short length deposits, and it is simply wonderful to note the texture and beauty of the product. A glance at the records of asbestos production and values in the Canadian records of mining comes as a revelation to a South African, who (let us speak sarcastically) thinks only in millions, while frequently he has to live in very much humbler surroundings. The commercial and national value of asbestos has been fully proved and admitted by both the Canadian and the Australian mining authorities, yet here in South Africa millions of tons of it are allowed to lie undeveloped. Mining men in the Transvaal have been credited with saying that Natal and Zululand mining propositions must stand back until the "bottom falls out of the Rand." This of course is rank nonsense. Where the treasure is there will be the capital, and given fair treatment there will dawn true prosperity, not begotten of the bolstering of defunct mines for mere financial considerations, but from the genuine output of commercial productions that will solidly add to the wealth of the country. Mineral phosphates are now known to exist in several parts of Natal and Zululand, while marble, limestone, gypsum and mica are also on record in great quantities. Enough has, I think, been said in a sketchy manner to indicate the vast potentialities of the country. Those whose interest has been aroused have only to call on the Commissioner of Mines in Maritzburg to be put in possession of the fullest possible amount of information. I can, from personal experience, testify to the thoroughness, the courtesy, and the zeal of every officer attached to the Mines Department in Natal, and can confidently refer all seeking information, with a view to business, to devote a few hours to an investigation of the stored information that is not only available but readily placed at the disposal of all who seek information. I would also express my thanks to Dr. Warren, of the Maritzburg Museum, for his courtesy and kindness in affording me access to his valuable collections and library.

Swaziland Tin.

The following are the results of the operations of this company for the month of January, 1920: Concentrate recovered, 30 long tons; estimated profit (taking tin at £381 per ton), £4,228; add adjustments in respect of previous shipments, £196; total profit, £4,424.

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THE WEEK IN THE SHAREMARKET.

A Good Opening Followed by Weakness—Black Labour Troubles Replace White—Business Restricted.

The news of the strike settlement caused an active market on Monday, and business all round expanded. The improvement, however, was but short-lived, as rumours of native unrest on the mines began to come in and had a depressing effect on business for the rest of the week. Until this new menace to the market is removed it is unlikely that any great activity will be seen, and we can only hope that the efforts of the experts in native affairs will be successful in satisfying them of the substantial nature of the increases in pay now offered to them. Meanwhile it is noteworthy that, following upon the recent introduction in the New York market of Rand Mines "American Certificates," it is now officially announced that, as long foreshadowed, a similar procedure has been adopted in connection with a block of 32,000 existing deferred £2 10s. shares of De Beers Consolidated Mines, Ltd. This block will be held in trust, and against it have been issued 80,000 De Beers "American Certificates," each of which will, obviously, represent two-fifths of an English deferred share. The price at which Messrs. Lazard Frères have successfully offered the certificates for public subscription in New York is 47 dollars, which, at, say, 3½ dollars to the £, would represent a price of about 33½ for De Beers deferred English shares. The favourite London Stock Exchange view is, however, that the latter are destined for at least 40 sooner or later, however they may be kept back for the present by temporary adverse market influences. All diamond shares, indeed, are likely to go higher in the near future, owing to the present excellent prices for the stones. It is understood that the negotiations which have for some time been proceeding between the Anglo-American Corporation of South Africa, Ltd., and the Rand Selection Corporation, Ltd., for closer relations, have now reached an advanced stage. While it is not possible yet to make a definite pronouncement, as certain matters of detail remain to be settled, a union of interests of the two companies is not unlikely to be effected in the near future. There is much to be said for such a development, for the two companies already have interests that form a natural link, and so far as the Rand Selection Corporation is concerned a fusion with the Anglo-American Corporation would give it the benefit of a widened scope of activity. It may be recalled that the Anglo-American Corporation recently entered into an agreement that gave it control of the principal diamond producing companies in the former German South-West Africa Protectorate. Interest in this acquisition has lately been enhanced by the finding in South-West Africa of diamonds of large size. Any financial scheme affecting the two South African companies named naturally closely concerns the Consolidated Mines Selection Company. An official announcement is expected in the near future. The week's changes are as follows:—

	Fri., 13th.	Sat., 14th.	Mon., 16th.	Tues., 17th.	Wed., 18th.	Thurs., 19th.
Anglo Americans	52 6	53 6	53 0	54 6	53 3*	52 3
Apex Mines	6 3	6 6	6 6B	6 0*	6 9	6 6*
Aurora Wests	—	—		5 6x		—
Bantjes Cons.	4 6*	4 6	4 0	4 7*	4 6*	4 9*
Brakpan Mines	76 0†	73 6*	75 6*	73 6*		76 0†
Breyten Collieries	8 0*	—		—	8 0*	—
Brick and Potteries	4 6	—				
Bushveld Tins	2 0	1 11	1 11*	2 0	1 11*	1 10
Cassel Coals	—			30 0	30 0*	30 0*
Cinderella Cons.	7 0†	6 0*	6 9	6 9*	6 9	6 6
City & Suburbans	8 0	7 9*	7 9	8 6*	7 9*	7 9*
City Deeps	68 0†	67 6†	68 0†	64 0*	67 6†	67 0†
Clydesdale Collieries	24 6*	24 0		—	—	26 0†
Cons. Investment	—	39 0†	39 0†	34 0*	37 6†	—
Cons. Langlaagtes	26 9†	26 6*	27 6†	26 0	26 0*	26 0
Cons. Main Reefs	15 0	15 9	16 6	16 3	16 6	16 6
Cons. Mines Selection	31 0*	32 0	32 6*	32 6*	32 0*	32 6*
Coronation Collieries	—	65 0	—			—
Coronation Freeholds	2 2†	2 6	2 3†	2 0*	2 1*	2 1*
Coronation Syndicates	13 6	17 6	17 [illegible]	17 0*	17 3*	17 0*
Crown Diamonds	12 3	12 3	12 0*	12 0B	12 3*	12 0*
Crown Mines	32 0	32 [illegible]	33 [illegible]	32 0	32 6	30 [illegible]
Daggafontein Mines	19 6	20 0	20 [illegible]	20 3B	19 9	19 0
Do. Options	5 3	5 3	5 0	5 0	5 0	4 6*
East Rand Coals	2 6†	2 4*	2 4*	2 5	2 5	2 5*
East Rand Deeps	1 2	1 2*	1 2	1 2*	1 2*	1 2*
East Rand Props.	12 0	13 9	15 6	14 9	13 6x	13 9
Eastern Golds	—	—	—	—	1 3	1 3*
Ferreira Deeps					12 0†	—
Frank Smith Diamonds	6 6	6 9*	7 7½	7 11	7 9*	7 11
Geduld Props.	56 3*	57 0	57 6*	57 6	57 6*	56 6
Ginsbergs	2 6		—	—		
Glynn's Lydenburgs	18 0†	18 6†	—	—	18 6†	—
Government Areas	97 6	98 0	99 9	99 0	98 0*	97 6
Jhb. Board of Executors	35 0*	35 0*	35 0*	35 0*	35 0*	35 0*
Jupiters	6 3	—	6 0*	6 6†	6 0*	
Klerksdorp Pros.	2 1	—	2 1*	2 1	2 1*	2 1*
Knight Centrals	6 9*	7 2	7 7	7 6	7 3*	7 4
Knights Deep	10 0	11 0*	11 0*	11 0*	11 0	11 6†
Lace Props.	17 0†	16 9*	15 9*	15 6*	16 6†	—
Leeuwpoort Tins	29 0	29 0*	29 3*	29 3	29 6	29 6
Luipaardsvlei Estates	5 0	5 0*	5 0*	5 0*	5 0*	—
Lydenburg Farms	7 6*	7 7*	7 10	7 10	7 10*	7 10
Meyer & Charltons	95 0*	—	—	97 6x	100 0*	100 0*
Middelvlei Estates	2 0	2 1*	2 0*	2 0*	2 0*	2 0*
Modder B's	158 6	159 0	158 0	158 6	157 0	157 0
Modder Deeps	54 9	55 0	56 9	56 6	55 9	55 6
Modder Easts	26 9	26 9	26 9	26 7½	26 6	26 6
Do. Options (3 years)	6 0*	6 6	6 10	6 4	6 3*	6 3
Do. Options (4 years)	10 0	10 3	10 9	10 10½	10 9	10 6
Hume Pipes	22 6†	22 6†	20 0*	22 0†	20 6*	21 0*
Natal Navigation Colls	25 0*	—	—	—	—	
New Boksburgs	2 4†	2 3x	2 9†	2 3*	2 9†	
New Eland Diamonds	72 6	71 3*	71 3	72 6	73 9*	72 6*
New Era Cons.	10 6	10 3*	10 3*	10 9	11 0	10 9*
New Geduld Deeps	2 3*	2 2*	2 2*	2 2*	2 3	2 2*
New Heriots	10 6†	11 0†	—	10 6†	—	9 0*
New Kleinfonteins	15 6	15 6	15 9	14 9	14 9	14 0
New Modders	85 6	86 6	86 6	85 6	85 3	84 0
Nigels	7 0	7 0	8 6*	8 6*	9 0	9 6*
Nourse Mines	—	—	15 0	15 0*	—	—
Premier Preferreds		—	—	152 6*	155 0*	
Pretoria Cements	95 0	96 0	95 6	95 3*	94 6*	94 6
Princess Estates	2 9*	2 10	2 9	2 9	2 3x	2 9*
Rand Collieries	4 0†	—	—	—	—	—
Rand Nucleus	—	2 3†	2 3	2 0	2 0	2 6†
Rand Selections	102 0	104 0B	107 0	107 0	110 0	107 6
Randfontein Deeps	6 9*	6 9	7 3	6 9*	6 9	6 9*
Randfontein Estates	27 3	27 9	27 9	27 6	27 6	27 0
Roberts Victors	17 6*	17 6	18 0	17 0*	18 0	18 3
Rooibergs	9 9	9 6	—	9 6	9 3	9 0
Roodepoort Uniteds	6 0†	6 0†	9 6*	—	10 0†	
Rose Deeps	21 0†	22 0	21 0	22 6	23 0	—
Ryan Nigels	—	—	4 2†		3 9	4 2†
Shebas	3 6†	2 6	3 3†	2 6	2 6	2 6*
Simmer & Jacks	—	—				8 6†
Simmer Deeps	3 3*	3 9	4 0	3 9	4 0†	3 6*
S.A. Lands	6 2*	6 4*	7 0	6 6*	6 6*	6 6
Springs Mines	58 9	59 3			58 3	57 9
Sub Nigels	18 3	19 0	19 3	18 3	18 6	18 3
Swaziland Tins	14 6	15 0†	14 0*	15 0	14 0	14 3*
Transvaal Lands		—			27 6†	27 6†
Transvaal G.M. Estates	16 6*	16 9			16 6*	16 6*
Van Ryn Deeps	100 0	100 6	104 6	104 0	102 6	101 6*
Village Deeps	17 6†	17 6	17 0	17 0		16 0*
Village Main Reefs				10 0†	10 0†	10 0†
West Rand Cons.	7 0*	8 0†	7 6	7 0*		8 0†
Western Rand Estates	7 6	7 6	8 0	—	8 0	7 9*
Witwatersrands	22 0†	22 6†	22 6†	22 0*	22 0†	22 0†
Wit. Deeps	11 3*	11 3*	13 0	13 0	14 0	15 0†
Wolhuters	5 9	5 9	7 0	6 3	6 3	6 0*
Zaaiplaats Tins	10 6	11 0	12 3	11 6	11 6	11 0*
Union 5 per cent.	£104	£104	£103⅞	£103⅞*	£103	
New State Areas	29 9x	31 0	30 3*	30 0B	30 3	30 0*
Rouxville Diamonds	22 0	23 0	23 6	21 0*	23 6*	23 0*
Southern Van Ryns	9 9	10 3	10 0	10 3	9 9⅞	9 9
S.A. Townships	14 9	15 0*	15 3*	15 0*		
S.A. Alkalis	22 0*	21 0	21 6	20 0*	21 6	25 0
Victory Monarchs	59 6*	59 0*	59 6*	59 0	59 0*	59 0*
Van Dyks	2 6*	2 6	—	2 9⅞	3 0	3 6
West Springs	22 3	22 6	22 10½	22 9	22 9	22 3*
Do. Options	6 6x	7 3	7 3	6 3*	6 3*	6 3*
National Bank	295 0	295 0	295 0†	295 0†	295 0†	295 0†
New Stock, 4½ per cent.	£102½†	£102¼	£101†	—	—	—
New Stock 5 per cent.	£102½†	£101½†	£101½†		£98*	£102

*Buyers. †Sellers. xEx London. BOdd lots.

THE CHAMBER OF MINES AND THE MINERS' DEMANDS.

Consolidated Pay Conceded—Shorter Hours Refused—Further Ballot to be Taken,

THE following letter was addressed by the Secretary of the Chamber of Mines to the Secretary of the South African Industrial Federation, dated February 13

Dear Sir,—As a result of the conference held between the representatives of your Federation and the Chamber of Mines on the 10th and 11th inst., I am instructed to inform you that the decision of the Chamber is as follows:

On the demand "That a flat rate increase be demanded of £2 8s. per week on present rates exclusive of war bonus," circumstances have changed in two important respects since the Chamber's first reply. As regards the matter of increase, the mines are for the time being in a better position to pay the increased amount than they were at the date when that reply was given. As regards consolidation of wages and cost of living allowance, since your representatives have frankly admitted that economic circumstances may in the future necessitate reduction of wages, the Chamber's principal objection to consolidation is removed. The Chamber is therefore willing to accede to this demand. The additional £2 8s. per week demanded will therefore be paid as from November 1, cost of living allowance or war bonus being discontinued as from the same date and any amounts already paid on bonus being set off against the amount due on account of the £2 8s. a week flat rate.

Learners, etc., earning less than the basic rate of 12s. 6d. a day will also participate proportionately.

With reference to the demand of the Federation "That we demand a 40-hour week for all men working underground and a 44-hour week for surface workers," the reasons which actuated the Chamber in refusing have not been in any way modified in the interval, nor indeed did your representatives at the Conference bring forward any effective arguments against them. I may remind you that in the Chamber's previous answer, which was handed to you on the 6th January and published in the Press on the 13th and 14th idem, the Chamber pointed out that the governing factor of underground production was the efficiency of the native labourer; that the reduction of hours which took place in 1918 had conclusively shown that such efficiency was seriously and permanently affected by any reduction in hours asked for, resulting as it would do in reducing the native's present working time of 36 hours to approximately 28 per week, must necessarily have a disastrous effect upon the industry. Further, the holidays which have already been granted (including the recently conceded May Day and Dingaan's Day) are the equivalent of a very considerable diminution in the hours worked per week. For these reasons the Chamber regrets that, after the most careful consideration, it is unable to accede to this demand.

With regard to the remainder of the demands, the Chamber's answer will be furnished you in a few days.—Yours faithfully,

(Signed) E. L. R. KELSEY.

(Secretary and Legal Adviser).

After discussion of the letter on Saturday by the Miners' Union, it was decided not to strike, and to take a further ballot on the hours question.

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PERSONAL.

Mr. L. Kessler, M.I.M.M., is on a visit to South Africa.

* * * *

Mr. B. I. Collings, of Salisbury, is on a brief visit to the Rand.

* * * *

Col. Sir W. Raleigh Grey has returned to Salisbury from his visit to England.

* * * *

Sir George Albu has left for England on a brief business visit.

* * * *

Mr. H. S. Potter, the well-known mining machinery merchant, is leaving on a business trip to England this week.

* * * *

Mr. A. A. English, A.R.S.M., A.I.M.M., has returned from Colombia and is now in South Africa.

* * * *

Mr. Ronald Sawyer, who has been ranching in Rhodesia, has returned to his old profession of mining on the Rand.

* * * *

The "New Rand, Ltd.," is to be voluntarily wound up, and Mr. A. R. Sawyer appointed liquidator.

* * * *

Mr. W. B. Phelps, Manager of the British General Electric Co., Ltd., has returned to the Rand after a trip to England.

* * * *

The gold medal awarded by the Council of the Institution of Mining and Metallurgy is the highest distinction in the power of the Institution to confer.

* * * *

Sir Lionel Phillips cabled during the week to London denying the rumours that extensive changes were contemplated in the personnel of the Corner House.

* * * *

The list of certificates issued by the Mines Department for the period ending 11th February, 1920, is as follows:—Mine Managers (Metalliferous Mines): F. A. H. Bailie, H. Birrell, A. S. Davis, P. B. Ellis, L. G. Fox, T. W. Gilbert, H. Grigg, J. Grusd, H. Hammar, H. W. Hancock, A. L. James, W. H. Jones, H. E. Maasdorp, J. D. Mackenzie, T. le R. Roskilly, W. Scott, R. L. Ward, M. P. Woolf. Mine Overseers (Metalliferous Mines): G. Cottrell, D. Currie, H. L. Kendrick; (Collieries): J. Holland, W. Jones, T. R. Ness.

ENGINEERING SECTION.

A TECHNICAL DIGEST.

Deep Shafts and Wells—Electricity in Mines.

COAL CUTTING MACHINERY.

In Part II. of the General Report on Mines and Quarries in 1918, the Chief Inspector of Mines reports that in 1918 there were 695 collieries where coal cutting machines were at work, as against 678 in the preceding year. The total number of machines employed was 4,041 (as against 3,799 in 1917), of which 1,797 were worked by electricity and 2,244 by compressed air; the total quantity of mineral obtained in 1918 by the aid of these machines was 27,873,646 tons; this is a decrease of 322,840 tons compared with 1917. The Scotland Division (No. 1) and the York and North Midland Division (No. 3) take the lead as regards the number of machines employed, nearly 49 per cent. of the total number of machines in use being employed in these two divisions. Table A shows the number of machines, and of collieries where used, motive power employed, and quantity of mineral obtained by their use in the various inspection divisions during the year 1918, and Table B the number of mechanical coal cutters in use in the various inspection divisions. The table below specifies the quantity of mineral cut by machinery in the various inspection divisions during the year 1918:—

Division	Statute tons cut by Electricity.	Statute tons cut by Compressed air.	Ttl. cut by machinery.
	Tons.	Tons.	Tons.
Scotland...	9,293,371	908,760	10,202,131
Northern...	1,367,873	2,771,324	4,139,197
York and North Midland... ...	3,882,888	3,598,330	7,481,218
Lanc'hire. N. Wales & Ireland	333,533	2,348,530	2,682,063
South Wales...	280,405	543,399	823,804
Midland and Southern . . .	1,532,712	1,012,521	2,545,233
Total in 1918	16,690,782	11,182,864	27,873,646
Total in 1917	16,574,310	11,622,176	28,196,486

ELECTRICITY IN MINES.

The Coal Mines Act requires a return to be made on the 21st January of each year of the aggregate horse-power of electric motors in use above and below ground at each coal mine. A summary of the returns received on the 21st January, 1919 (Part II. General Report on Mines and Quarries) is given below:

Division.	Surface. H.P.	Underground. H.P.	Total. H.P.
Scotland...	40,330	143,869	184,199
Northern	112,375	114,949	227,324
York and North Midland	98,451	82,049	180,500
Lancashire, N. Wales and Ireland	20,989	31,109	52,098
South Wales...	125,770	124,286	250,056
Midland and Southern	18,860	52,330	71,190
Total...	416,775	548,592	965,367

It will be seen from the following tables that the figures for 1918 show an increase over the corresponding figures for 1917:

	1917.	1918.
Surface—		
Horse power	391,741	416,775
Per cent. increase on preceding year	6·32	6·39
Underground		
Horse-power	521,896	548,592
Per cent. increase on preceding year ...	8·23	5·12
Total		
Horse power	913,640	965,367
Per cent. increase	7·40	5·66

The number of electrically driven coal-cutting machines in use at the end of 1918 was 1,797, an increase of 58 over the number in use at the end of 1917. The percentage increase of h.p. above and below ground, taken together, was lower in 1918 than in any year since, and including, 1912, when the figures were first available. This is reflected particularly in the small increase in the number of coal cutting machines; 3·3 per cent. only, against an increase for the previous year of 9·3 per cent. The slow rate of growth during 1918 was due to other demands upon the engineering works of the country. During the year 1918 there were in all seven fatal accidents at mines definitely due to electricity investigated by H.M. insepctors of mines. Of the seven electric shock accidents above referred to, one took place on the surface and six below ground. The figure for electric-shock accidents below ground shows an increase on the previous year. Number of persons killed by electric shock below ground in coal mines:—1907, 10; 1908, 12; 1909, 13; 1910, 15; 1911, 9; 1912, 7; 1913, 13; 1914, 4; 1915, 8; 1916, 4; 1917, 2; and 1918, 6. The increase in the number of electric-shock accidents below ground from two in 1917 to 6 in 1918 is disappointing, and consideration of the details of each accident, given in the report, show that, with one or two possible exceptions, all might have been avoided by attention to simple and well-established safeguards. The object in publishing the details of all these accidents is to direct attention to defects, whether of plant or organisation, which have produced fatal results, and for the information, in particular, of managers and electricians-in-charge. It is satisfactory to be able to record no deaths due to ignitions of gas or coal dust by electricity and no deaths due to underground fire caused by electricity during 1918

FINE GRINDING IN BALL-MILLS.

By Henry Tanson, "Mining and Scientific Press," January 3rd, 1920. This article discusses the general adoption of ball-mills as grinding machines. Crushing resistance of various ores. Tests to determine comparative resisttances. Factors affecting crushing efficiency. Various possible methods of including ball-mills in grinding schemes. The "one easy step" theory has serious limitations.

COAL HANDLING BY SUCTION.

The issue of the Iron and Coal Trades Review of January 16, 1920, describes the coal handling plant installed by Messrs. Boots in connection with the power station at their Northampton works.

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MINERS' NYSTAGMUS.

A valuable paper on the cause, symptoms, incidence, and means of prevention of miners' nystagmus was contributed by Mr. T. Lister Llewelyn, M.D., B.S., at the meeting of the North Staffordshire Institute of Mining Engineers held at the Mining School, Stoke, in Mail week.

Dr. Llewelyn urged the dominating importance of increased illumination in safety-lamp mines, and suggested that the Mining Association of Great Britain and the Miners' Federation should each contribute £50,000 to a fund for research into a better means of illumination.

In the course of his paper he stated that there had been two chief views as to the causation of the disease—(1) the position assumed by the miner at his work, and (2) deficient illumination. Most English observers now held that the chief factor was deficient illumination. There were two distinct varieties of the disease. In the first, the symptoms were absent or latent, and the man, suffering no disability, was unaware that he had nystagmus; in the second, the disease was manifest, and the man is more or less incapacitated. In his own series of 1,400 consecutive cases, 1,152 were manifest and 248 were latent.

DEEP SHAFTS AND WELLS.

A bulletin just issued by the United States Geological Survey discusses deep wells and shafts. The subject is of great local interest, in view of the depths already attained on the Witwatersrand and the prospects for sinking to even greater depths than those so far reached. The bulletin is, however, not correct in regard to the maximum depths reached in mines, and we comment on this in our "Notes and News" column. In view of the scientific and industrial interest attaching to this matter we quote from the bulletin at length.

TWO DEEPEST WELLS IN THE WORLD.

During the last few years the Hope Natural Gas Company and the People's Natural Gas Company, both of Pittsburgh, Pa., have been drilling deep wells in northern West Virginia and south-western Pennsylvania to find deeper oil-bearing and gas-bearing sands, their object being to reach, if possible, the horizon of the rich Clinton sand of Ohio, which, according to Dr. I. C. White, the State geologist of West Virginia, should be found in this region at depths between 7,000 and 8,000 feet.

DRILLING FOR DEEP OIL AND GAS.

The first exceptionally deep well thus drilled, the R. A. Geary well, of the People's Natural Gas Company, is about four miles north west of McDonald, Pa., and about 20 miles south-west of Pittsburg. The mouth of the well is about 1,050 ft. above sea level. The well penetrates the Gordon stray sand, the last of the usual gas sands in this region, at a depth of 1,971 feet. From this point to a depth of 6,700 ft. the strata penetrated are alternately "lime" and "slate," and from 6,700 ft. to the bottom, 7,248 ff., they are "sand" and "lime" interspersed with about 60ft. of rock salt. The second deep well was drilled by the Hope Natural Gas Company on the farm of M. O. Goff, about eight miles north-east of Clarksburg, in northern West Virginia. Its mouth is 1,164 ft. above sea level. The well begins 200 ft. below the level of the Pittsburg coal and penetrates the usual oil-bearing and gas-bearing sands, the lowest being the Bayard, which lies at a depth of 2,210 ft. The strata in the remainder of the well are alternately "lime" and "slate." The third deep well, the J. H. Lake, of the Hope Natural Gas Company, is about 8 miles south-east of Fairmont, W. Va. It is about 20 miles north of the Goff well and about 60 miles south of the Geary well. The mouth of the well is about 1,300 ft. above sea level. The Bayard sand, the lowest of the gas sands, was found in this well at a depth of 2,050 ft. The remaining strata are alternately "lime," "slate," and "sand."

FOUR DEEPEST WELLS IN THE WORLD.

Named in order of depth, the four deepest wells in the world are the Lake, 7,579 ft.; the Goff, 7,386; a well at Czuchow, Germany, 7,348; and the Geary, 7,248. The two deepest wells in the world are therefore the Lake and the Goff, the Lake surpassing the German well by the large margin of 231, ft. In comparison with these great depths, other depths reached by wells or mines sunk in the crust of the earth are rather insignificant. The deepest mine in the world is shaft No. 3 of the Tamarack mine, in Houghton County, Mich., which has reached a depth of 5,200 ft. Other shafts of the Tamarack Company and of the Calumet and Hecla mine, in the Lake Superior region reach depths between 4,000 and 5,000 ft. Three shafts in the Prizbram silver mines, in Austria, have reached depths of about 3,300 ft. The Victoria quartz mine, at Bendigo, Australia, is 4,300 ft. deep. A number of shafts in the Transvaal gold region of South Africa have been sunk to depths of about 4,000 ft.

LIMITS TO DEPTHS OF MINES AND WELLS.

The depth to which a mining shaft can be sunk is limited by the heat of the rocks, as the temperature at a depth of a mile in nearly all parts of the earth is so high that workmen cannot live in it, even with ventilation. The depth to which a well 6 in. in diameter can be drilled seems to depend chiefly on skill in drilling and strength of cable. The cable itself is heavy, and besides carrying its own weight and the weight of a drill, which weighs 1 or 2 tons, it must bear strains produced by vertical movements of the drill, which may be so great as to break it at any moment, so that the drill and a part of the cable may be lodged in the well in such a way that they cannot be removed. Exceptional skill is required, therefore, in operating the ponderous machinery used in drilling a well. The drill, which is a column of steel about 5 in. in diameter, and 40 or 50 ft. long, bevelled to a V-shaped edge at the lower end, is attached to one end of the cable, and at some other point, determined by the driller, the cable is attached to a long beam, which is operated in the same manner as the walking beam of a steam boat. Merely to lift the drill through the height determined by the swing of the end of the walking beam and to let it drop repeatedly would do no drilling. In order to drill, oscillations must be induced in the cable, such as those set up by attaching a light weight to a suspended rubber band. A slight oscillation properly induced by the finger at the upper end of the rubber band will produce a very large oscillation at the weight attached to its lower end. In some such way as this the skilful driller produces oscillations in the drill bit, which throw the sharp bevelled edge of the drill on to the rock with high velocity. The only means that the driller has of knowing the behaviour of the drill is the general behaviour of the machinery, and the slight impulses or tremors in the cable, which he detects by his hand alone.

DEEP DRILLING IS INSTRUCTIVE.

The information obtained from drill holes carried to great depths is of exceptional economic and scientific importance. Although the wells drilled by the Hope Natural Gas Company and the People's Natural Gas Company have not yet reached the goal sought—a depth of 8,000 ft.—they have, nevertheless, come within 421 ft. of the goal, and incidentally they have established the fact that no valuable deposits of oil exist in the immediate vicinity of the wells at depths somewhat greater than 7,000 ft.

WHAT'S IN THE INTERIOR OF THE EARTH?

The materials and the conditions in the interior of the earth have long been a favourite subject of speculation among scientific men. According to the modern mathematical theory of the propagation of earthquake waves through the earth the outer rocky shell of the earth, which is about two and one-half times as heavy as water, extends to a depth of less than 1,000 miles. Inside of this shell is some material, probably metallic, which is more than five times as heavy as water. Estimates of the temperature at the centre of this nucleus range from 3,000 degrees to 180,000 degrees F., but these figures have little or no value, for mathematicians have not yet found the law of the distribution of temperature from the surface to the centre of the earth. The temperature evidently increases with the depth, a fact again confirmed by an elaborate series of observations of temperature made in each of the three deep wells, the Geary, the Goff, and the Lake, by C. E. Van Orstrand, of the United States Geological Survey, Department of the Interior. In each of these wells the temperature at a depth of 100 ft. is about 55 degrees F. and gradually rises with increase in depth, reaching 142.0 degrees F. in the Geary well at a depth of 6,100 feet, 159·3 degrees F. in the Goff well at a depth of 7,500 ft. The observation at a depth of 7,500 ft. in the Lake well was made at the deepest point yet reached by any observer.

UNEXPLAINED ENORMOUS HEAT.

The source of the enormous quantity of heat stored in the interior of the earth is not known. Some writers think this heat is due to the disintegration of radium in the rocks, others think that the earth is a cooling globe, radiating heat developed during condensation from the original nebula, and others think that it is due to various causes, such as radioactivity, chemical reactions, impacts from meteorites, or condensation from nebulous material.

SOME INTERESTING RESULTS OF DEEP DRILLING.

The strata of lime, slate, and sand penetrated by these deep wells were originally sediments deposited from ocean water. A bed of ocean water was actually found in the Geary well at a depth of 6,260 ft. Dr. I. C. White, State Geologist of West Virginia, with whom the United States Geological Survey is co-operating in these investigations, is of the opinion that this water is a fossil ocean, imprisoned since mid-Paleozoic time. Interesting evidence in regard to the geologic history of the formations was obtained by Charles Butts, of the United States Geological Survey, who identified a number of fossils from depths of 7,187 to 7,355 ft. in the Goff well. The material from the Lake well has not yet been fully examined. It may be possible by examining the fossils to determine the geologic ages and horizons of the beds penetrated and so to estimate the depth at which the Clinton sand should lie beneath the bottom of this well. The well probably does not pass through more than one-half the total thickness of sediments in this region."

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ELECTRIC CLEANING OF BLAST-FURNACE GASES.

The Iron and Coal Trades Review of January 9, 1920, contains an abstract of a paper recently read before the American Association of Iron and Steel Electrican Engineers. The paper describes the installation of a new type of blast-furnace gas cleaner and the results obtained with it at the furnace of the American Manganese Manufacturing Company at Dunbar, Pa. (U.S.A.). The cleaner is the first of its kind in existence and an adaptation of the Cottrell electrical precipitation process, which, while new to the blast furnace, has been in extensive use throughout the country in the cement industry as well as in various metallurgical processes. In ordinary blast-furnace parlance—the authors remark—the air is not talked of as part of the burden, yet it is the largest single item of load by weight that goes into the furnace. A 500-ton furnace will use about the following quantities of materials: 1,000 tons of ore, 500 tons of limestone, 750 tons of coke, and 3,350 tons of air, making a total of 5,600 tons per day. The air issues from the top of the furnace in the form of an inflammable gas with a heat value of from 90 to 100 B.T.U. per cub. ft. at standard conditions of temperature and pressure. The carbon in the gas represents 50 per cent. of the total carbon in the coke originally charged into the furnace. It therefore can readily be seen that the utilisation of this gas is of prime importance, not only in the economies to be effected in the operation of the blast-furnace plant, but in the very production of the metals at anything like saleable figures. The furnace, therefore, is a gas producer, but the gas contains besides the inflammable and non-inflammable gases, vapour, dust and fume, and dust and fume make burning gas at its maximum efficiency a difficult problem. The large saving that may be effected by properly cleaning the gas is an appreciable portion of the economies to be found in the use of clean gas, and it consequently follows that the cleaning of the blast-furnace gas becomes an important problem and almost a necessity if the best economies are to be obtained.

Witwatersrand Deep.

The estimate of the results for the month of January, 1920, are as under: Tons milled, 28,020; gold recovered, 7,579·053 fine ozs.; average number of stamps running, 200; mill running time, 19·12 days; tube mills, 5; development footage, 390 ft. The working expenditure, including head office charges for the month, is £35,885, or 25s. 7d. per ton. The estimated working revenue, based on an estimate of £5 7s. 6d. per fine oz., is £42,595, or 30s. 5d. per ton. The estimated working profit is £6,710, or 4s. 10d. per ton. The estimate of £5 7s. 6d. per oz. is based on the latest reports received from the London Office of the company regarding gold realisation. From time to time, as account sales are received, the further premium obtained from the sale of gold will be published for the information of shareholders.

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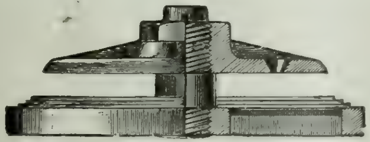

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Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Prof. Schwarz on the Kalahari Scheme.

To the Editor of the SOUTH AFRICAN MINING & ENGINEERING JOURNAL.

Sir,—As a matter of interest to the general public, I would like to mention that I have concluded arrangements with Professor Schwarz for the publication of his volume on the Kalahari scheme, which will be entitled, "Thirst Land Redemption," and will be a complete statement of the Kalahari project, fully illustrated with maps, photographs, etc. In these days of labour unrest and difficulties, we fear that the book will not be ready much before June or July, when it will be duly advertised in your paper. Thanking you in anticipation.—Yours, etc.,

T. MASKEW MILLER.

Capetown,
16th February, 1920.

Remuneration of Mining Engineers and Metallurgists.

To the Editor of the SOUTH AFRICAN MINING & ENGINEERING JOURNAL.

Sir,—The following resolution has been unanimously adopted by the Council of the Institution of Mining and Metallurgy, and I am desired to express the hope that you may be able to reproduce it in your columns, a courtesy which would be much appreciated:—(1) That the economic conditions now prevailing call for a revision of the pre-War scale of remuneration of mining engineers and metallurgists whether they are engaged in the British Isles or abroad; (2) that members of the Institution of Mining and Metallurgy are entitled to an increase in fees and salaries commensurate with the depreciated value of money and the increased cost of living; (3) that it is recognised that many mining companies have already provided at least partially for the altered conditions and the Institution confidently relies upon boards of directors to meet the new situation in a fair and reasonable spirit.—Yours, etc.,

C. McDERMID,
Secretary, I. of M. & M.

1 Finsbury Circus,
London, E.C. 2.,
29th January, 1920.

Far East Rand Geology.

To the Editor of the SOUTH AFRICAN MINING & ENGINEERING JOURNAL.

Sir,—The Geological Survey says that the Cason and Blue Sky, north of the town of Boksburg, are identical with the Van Ryn series, and that all gold mining companies on the Far East Rand are working on one reef, viz., Main Reef Leader, with a shale foot wall—even round and down to the Nigel G.M. Co. Mr. St. John, General Manager of the Van Ryn G.M. Co., says in his annual report that he is working on seven reefs. Therefore, according to this gentleman, Main Reef Leader of the Central Rand should have six payable reefs overlying it here at Johannesburg. Where are they? The Geological Survey again says that the Randfontein series is Main Reef series. Yet the Group Engineers out there in their reports say that they are working five payable reefs. Hence the Central Rand, which claims pride of place with its Deep Deeps and two or three reefs is really nowhere with either the East or the West Rand. In my opinion the Geological Survey as far as the Rand is concerned, and much else, is "not worth tuppence," for it leaves out all payable series of reefs north of or underlying Main Reef, where nature has distinctly laid down six at least. It also entirely ignores the auriferous Black Reef series of the Black Reef age, which is five miles thick, and will very shortly, with a new Government in, account for more gold than the Main Reef series of the Witwatersrand age, here or elsewhere.

Unfortunately this may be Greek to most of your readers, but to those with inquiring minds it may give food for thought. The Southern Van Ryn G.M. Co., on the dip of the Nigel, is very much in the public eye at the present time, and is the *pons asinorum* of the so-called orthodox geologists to their next problem, viz., Heidelburg. With my thirty odd years experience of these fields, I unhesitatingly assert with regard to the Southern Van Ryn that in the series of reefs, viz., four—contained thereon, or thereunder, as you please, sir, there are to be found a dozen or more payable reefs from north to south of the property, in descending order. How, and why, "*cherchez* la Black Reef series, etc., etc."

Yours, etc.

SCOTT ALEXANDER.
"Rand Stratigraphist."

Johannesburg,
February 18, 1920.

The Lonely.

The following are particulars of gold output from the Lonely mine for the month of January, 1920: Mill ran 689 hours; crushed 4,550 tons; fine gold recovered, 2,024·003 ozs., value £8,517 1s. 6d.; slimes treated, 4,550 tons; fine gold recovered, 3,892·265 ozs., value £16,381 12s. 5d.; total fine gold, 5,916·268 ozs.; total value, £24,898 13s. 11d.; profit, £12,654 7s. 11d.

Trade with Germany.

The Board of Trade point out that any goods may be sent to Germany without licence, except goods on lists "A" and "B" of prohibited exports. Any goods may be imported from Germany, and paid for, without licence, except goods whose importation from all foreign countries is prohibited. The import prohibitions established during the War by means of Royal proclamations issued under Section 43 of the Customs Consolidation Act, 1876, have been temporarily suspended pending either reversal of Mr. Justice Sankey's judgment or legislative action to secure powers to impose a limited number of restrictions. Importers, however, should clearly understand that, in the event of these powers being conferred by Parliament, or in the event of the judgment being reversed on appeal, licences to import restricted goods will not be granted merely on the ground that the goods had been ordered between the date of the judgment ond that of the re-establishment of the restrictions, but will be based solely on consideration of the reasonable requirements of the country. Other transactions of a commercial or financial nature with firms in Germany are permissible without further licence, provided they do not involve:—The payment or receipt of money arising out of pre-War transactions; the delivery of or dealing with property held in Great Britain for persons in Germany since before the outbreak of War; the transfer of securities by or on behalf of a person in Germany; the allotment or transfer of securities issued by a company to or for the benefit of a German subject; the transfer of any debt or other obligation due to a person in Germany, arising out of pre-War transactions. As regards the financing of transactions, traders must make the best arrangements they can, and, in case of uncertainty as to the best mode of procedure, they should consult their bankers. Money due to or property acquired by German nationals as a result of transactions entered into since the resumption of trade with Germany was authorised are not liable to sequestration in this country. The same regulations apply in respect of Turkey, Bulgaria, and the former Austro-Hungarian dominions, except the collection of debts owed by persons or firms in these territories is allowed.

TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Things out of Joint—The Cost of Living—Flour Cheaper—The Building Trade—Iron and Steel—Second-hand Material—Electrical Goods.

THINGS are somewhat our of joint, for although the white miners have come to terms as regards money matters, yet another disturbing element immediately follows on, through partial strikes of the Kafirs at the mines. It is also not too much to say that the forthcoming elections are casting their shadows before. Perhaps the crux of the whole matter is that the banks are charging very high rates, from 4½ to 7½ per cent. on drafts on London, according to the period of time as to maturity. The rise on scrip drafts from one-sixteenth to 4½ per cent. came very quickly, and naturally upset the share market. Several bank managers have been interviewed, and they disclaim any idea of business not being carried on as usual. That is not exactly the position, as undoubtedly the facilities for obtaining advances have been here and there restricted. A manager remarked that a lot of speculation had taken place throughout all channels of trade, more particularly in soft goods, and especially in maize, flour, wheat, mining material, oils and colours, piping and so forth. Therefore many of these things changed hands several times, and obviously on each occasion the speculators obtained a profit, all of which in the end came upon the consumer. Another manager remarked that a lot of speculation has taken place in properties, but now if anyone wished to buy a £10,000 to £15,000 building his bank would not be a party to it from a speculative point of view. The policy of the banks has been much criticised, but something had to be done to prevent the gold leaving their coffers and the major portion being hoarded or spirited away oversea. The present rates for buying oversea drafts may be sufficiently heavy to assist the situation, but it must not be assumed that the new conditions will be maintained over any lengthened period, as circumstances alter very quickly. As merchants, brokers and others are as a general statement well off to-day in South Africa, this financial position is only expected to be a passing phase in our history.

THE COST OF LIVING.

There are, fortunately, signs that we are running along the top, as the cost of living is the one thing of paramount importance for the successful running of our gold mines and other industries. Thanks to the Government securing flour and wheat, the price of flour from miller to merchant has been reduced from 39s. 6d. to 37s. 6d. per 100 lbs.

These are some of the published facts in connection with the Government's announcement that it contemplated sending the s.s. Huntress to Australia to load flour if such a course was found necessary. It is said that the Ellerman-Bucknall Steamship Company now intend placing the following steamers on the berth in Australia during February and March, which will load as follows:— s.s. Sutton Hall, 4,100 ons of flour and 1,000 tons of wheat; s.s. South Africa, 200 tons of flour and 1,000 tons of wheat; s.s. City of Delhi, 4,000 tons of flour; s.s. Stanley Hall, 2,500 tons of flour and 1,900 tons of wheat; s.s. Wooma, reserving space for 750 tons of flour. The following information has also been obtained from Messrs. Gowan and Company:—The following shipments are now due: from the Argentine a steamer with 5,600 tons of wheat and a sailer with 2,100 tons of wheat. From Australia a sailer with 3,500 tons of wheat, due in March; from the Argentine a sailer with 2,750 tons of wheat. Messrs. Ellerman-Bucknall Steamship Company also advise the Government that if further shipments of flour are available in Australia they will arrange to load about 2,000 tons in February and March.

This has steadied the price of the 2lb. loaf now retailing at a 1s., prepared from wheaten flour, whereas there is a decent loaf mixed with part flour and part mealie meal at 8d. These might have dropped a trifle were it not for the extra labour demands, but even these are kept in check by the fact that Johannesburg contains so many small master bakers, that providing we can only get the ingredients the baking is a mere detail. The banks' restrictions have already made people think. The whole position summed up is that if one really wants to economise one can do so. The Municipal Market is still a little disappointing in its high prices, but signs are not wanting that the rains are doing their bountiful work and making butter a trifle cheaper at 3s. lb., and even less for an ordinary family. The forage and hay market is quite 2s. per 100 lbs. down, with teff grass at a discount. The vegetable market is also 25 per cent. cheaper and the fruit market has received quite a knock, especially for the ordinary kinds and qualities; for example pineapples at 2s. and 3s. per dozen, as well as the smaller sizes of pears, apples and peaches. All this is not perhaps saying much as meat is just as dear at the wholesale market, but owing to the great competition amongst the one-man butchers' shops the price is kept down to zero as regards profit making. However, there is a check in the property market, because financial facilities are not so great, since the 6 per cent. money from religious and similar institutions is practically a thing of the past, and the 6 per cent. brokers now say it is difficult to obtain mortgage money at even 7 per cent., as the price is 7½ to 8, and something was said about 9 per cent. in the near future. But rents have not come down as the pressure for house accommodation is greater than ever, but this may be relieved by many people going oversea during the next few months. But things are a little more hopeful, and by positively making ourselves to think so and act so it will make all the difference for good.

Since writing the foregoing the Government is suspending the Customs duties on wheat flour. This represents 2s. 6d. on flour, and as the railway rate will be reduced from No. 7 to No. 13 rate, that represents another saving of about 2s. from Durban, and 5s. from Capetown. Therefore the 2lb. loaf should come down to about 10d., that is if the consumer gets the full benefit.

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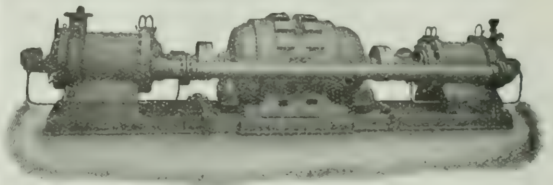

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THE BUILDING TRADE.

Actual building operations are active, but the contractors are shy in taking new contracts because of the difficulty in obtaining bricks principally, and timber is none too plentiful. Deals are 1s. 10d. to 2s.; floorings, 9¾d. to 10d.; and ceilings, 6¾d. to 7d. The 9 x 3 solid deals are very scarce, but scantlings are fairly plentiful. Roofing iron, 24 gauge, is 1s. 6¼d. to 1s. 8d. per foot, according to length, the latest cable quote from England being £60 per ton.

Some interesting evidence was tendered to the Local Government Commission on Monday, the 16th inst. Here are a few extracts:—Mr. Douglas said that carrying out big buildings departmentally (Municipal) was not economic. Maintenance work, he thought, should be carried out departmentally. The departmental system did not stand for high efficiency and economy. The present method, since the abolition of piecework, was working on standards, and a man got the standard wage though he might not be highly efficient. As to the danger of scamping under the contract system, the witness said the Public Works Department had a building inspector, who carried out supervision; there was little danger of the contractor bribing the official to pass poor work. Departmental work also was not so efficient; contractors did not like to employ men who had long been employed by the Johannesburg Town Council. The workers said that the competitive system was a sweating one, but up till lately that system had produced a high state of efficiency and attracted good men from all over the world. From next Saturday, the artisans in the building trade would be paid 4s. an hour for a 44-hour week, and that would be as good, if not better, than the wages paid anywhere else.

IRON AND STEEL.

Business is quieter, as the banks are said to be an uncertain factor as regards advances upon new importations and so forth. The Bank bogey is being a little overdone, as ordinary merchants will go on as usual, because if they have been in the habit of having a thousand pounds accommodation that will be continued, but if two thousand or double facilities on any amount are required, an interview in the bankers' blue-parlour will be necessary. In most cases the first or even second interview will be all right, but any signs of speculation will be nipped in the bud. The general manager of the Standard Bank is here from Capetown, and he has not a too optimistic view of financial affairs. Prices of all imported iron, steel, and hardware are gradually rising as America is pretty well out of our market, on account of the Exchange question, and the British manufacturers are fixed up so fully that they do business with South Africa as a favour. One leading merchant is out of patience with the mines, as they were advised to purchase more freely a few months ago, and now prices have risen they, in his opinion, complain altogether unfairly of profiteering. The mines' case is that they expected shipping freights to go down and so ease the situation considerably, and obviously it will happen, but it takes time. There is a big scarcity in steel plates, particularly in the smaller thicknesses, and these are up to 60s. or 70s. for one-sixteenths, wherever a few are to be picked up; for the larger kinds the quotations are from 45s. to 52s 6d. Imported mild steel bars, 35s. 6d. to 37s. 6d.; shovels, 65s. to 70s. per dozen; wheelbarrows, 70s. in quantities, but for ones or twos 75s is asked: Brass rods, 2s. 6d. Tool steel, 1s. 6d. lb.: drill steel solid 7½d. lb; dito hollow, 10d.; shafting, 7½d. to 8½d. Wire nails, 52s. 6d. to 65s., with an ever increasing tendency to go higher. It is anticipated that there will be exceptional inquiries on the Exchange for wire ropes very shortly.

SECOND-HAND MATERIAL.

There is a big demand for all kinds of tram trucks, and especially the spares and wheels for coco pans. A decent parcel of sleepers was seen in readiness to go to Rhodesia, and tram rails already to be put down are in great demand for up-country, and in fact all parts. There is also a strong demand for wood and machine shop lathes and the smaller bench requirements. As often pointed out, the second-hand yards are very bare of decent machinery, spares, and so forth, but the dealers with their motor cars are a very energetic crowd, and from week to week there is generally something new added to the small stock. The surprising part, however, is to notice what can be done by a Kafir black-smith and his assistant in making apparently old rubbish into decent workable parts. The old rails are used up to the last, as when they are too old to put in a tram track, they are converted into fencing posts, and lastly the absolute scraps into iron pegs. Perhaps even a greater surprise is the way the Kaffirs continue to turn with their anvils, lathes and other machines the very oldest of iron and brass bedsteads into a commercial article again. The Kafir skilled workmen in many lines are clever and have come to stay, whatever one's feelings may be.

Business in the second-hand timber, and iron yards has, contrary to expectation, been much quieter this week, notwithstanding the fact that stocks are now fairly plentiful, with more expected shortly to arrive. Inquiries are good, but business is sluggish. One reason alleged for the present lull is that people think that the present high prices are bound to come down shortly, but when it is seen that the rates are all right and are in fact likely to go higher, buyers will settle down and do business. Second-hand timber and iron can only be quoted nominally at about 1s. 3d.

ELECTRICAL GOODS.

Lamps are still rising, especially at Home, and those which are being sold here at the present prices cannot be replaced at anything like the same rates. It will, of course, be no surprise to learn that in view of the adverse exchange, American lamps have increased in price lately very considerably. Stocks generally are getting very short, and are practically unprocurable, one having to take a few here and there. Wooden blocks, for which there is a big demand, are very scarce indeed, and the price is rising; nominally they may be quoted at from 9s. to 10s. dozen, as against 5s., a few weeks ago. Ceiling roses are now anything from 30s. to 35s., as against 20s. to 24s. per dozen less than a month ago, and are getting every day scarcer and scarcer. Although tubing and wiring are also far from plentiful we are not feeling the pinch in anything like the same degree, but it is anticipated that within a couple of months they also will be in the same category. Adaptors are practically unprocurable, and those which can now and then be snapped up command ever-increasing prices. As an illustration of the shifts to which dealers under present circumstances are put, one merchant mentioned that in the ruling acute scarcity of C:G. holders he was only too pleased to avail himself of a chance to exchange some of these for split bobbins, which appeared to be a mutually advantageous one. The same dealer, who is a leading light in matters electrical, gave it as his undoubted opinion that prices of all electrical materials are bound to go very much higher here, and further that in his opinion people will shortly have practically to stop going in for any new installations at all. Country and town business continues good as far as inquiries and orders are concerned, but the execution of these orders is difficult for want of the necessary assortment.

Potash.

With the cession of Alsace-Lorraine to France, Germany loses the rich potash deposits of Alsace, and with them the potash monopoly of the world, according to the *Vossische Zeitung*. The potash deposits extend 16 kilometres (9·94 miles) to the north of Mulhausen, over a surface of more than 180 square kilometres (69·2 square miles). They are unusually rich in potash salts, much richer in fact than the beds in the interior of Germany. They are, moreover, easier to exploit. Their thickness ranges from 3·7 to 5·4 (12·1 to 17·7 ft.). The thickness of the smaller beds in the upper layers varies from 0·8 to 1·5 metres (2·6 to 4·9 ft.). The first workings were begun in 1909; in 1913 there were 12 in operation. In a period of only three years the production rose from 42,420 to 287,000 metric tons, so that the production of potash in Alsace in 1913 was already one-fifth of the entire German output. The total capital invested in the potash work of Alsace amounted to 34,400,000 marks ($8,187,200 at normal exchange). The production of these workings, it is calculated, would supply the world's requirements of potash for 250 years on the basis of the consumption in the last pre-War year. According to estimates made by Dr. Paul Kessler, the quantity of potash salts in Alsace amounts to nearly 1,500,000,000 metric tons, from which several hundred million tons of pure potash can be extracted. Before the War Germany exported potash salts to the value of about 100,000,000 marks ($23,800,000 at normal exchange). This exportation will undoubtedly be multiplied in the next few years in consideration of the enormously increased world demand.

New Patents.

Frank Richard Rand and Archibald Henry Vergine.—Improvements in collapsible crates and the like.

Frank Henry Dutton.—Improvements in semi-trailer tractors.

Thomas Henry Bradbury.—Improvements in the method of sharpening rock drills and the means therefore.

Wilhelm Goert Boonzaier.—Improvements in or relating to automatic couplings for railway and like vehicles.

Jacobus Johannes de Kuijer.—Deep water diamond hand dredge.

Seguin Fisher.—Improvements in hammer drill mountings.

David Gray Birse.—A new and improved automatic machine for the manufacturing of lead seals and for other articles of a similar nature according to shape of mould.

Attmar George Stark.—Improvements in pistons and in the process of making pistons.

Frederick Lionel Rapson.—Improvements in or relating to resilent wheels for vehicles.

The Imperial Trust, for the encouragement of Scientific and Industrial Research, John Edward Sears, and Arthur John Charles Brookes.—An improved method of and means for forming slip measuring gauges.

Alfred James Bishop.—Improved hand truck.

Thorsten Zweigbengk.—Improvements in or relating to electric-motor control systems.

Percy Lionel Gilbert Johnston.—Reinforced concrete beams, slabs, staircases, and other parts of buildings.

Francis Whitwell Brackett.—Improvements relating to the valves of pumps.

Locomotive Superheater Company.—Steam collectors for super-heaters.

Paget Baxter.—Improvements in locking devices for both nuts and the like.

EXPORT PRICES OF GERMAN COAL AND STEEL.

THE question of export values of German products in connection with the depreciation of the mark is discussed at length by the *Kölnische Zeitung*, which states that the price of coal in those countries whose currency has remained approximately on the same level as formerly has increased by about eightfold as compared with pre-War times. Having regard to the fall in the value of the mark, the price of coal abroad converted into marks is 80 times and over the pre-War price. On the other hand, in the German inland market coal prices have only advanced by about eight times the pre-War quotations. Scarcely any other bulk product shows a similar advance in the world's market. Especially is this true in the case of iron and steel products, the prices of which have only risen by from three to three and a half times, or, converted into paper marks, by 35 to 40 times the pre-War prices. The cause of this is assigned to the coal and iron price policy of Great Britain, which is mainly ruled by the freight market. The Cologne paper proceeds to state that the situation resulting from such changes in prices and the possibilities to be deduced therefrom for German national economy may be illustrated by an example. Thus the price of steel bars in Holland at the present time is about 230 florins (about 383s. at par) per ton. The value of the mark has recently declined to such an extent that 1,900 marks (as compared with 166⅔ marks at par) have to be paid for 100 florins. If then the price of the steel bars in question is converted into paper marks, it works out at 4,370 marks per ton. In Holland the price of English coal delivered free at place of consumption is about 80 florins, or 1,520 paper marks; English coke is 84 florins, or 1,596 paper marks; and American coal is 89 florins, or 1,690 paper marks. If it is considered that the coal freight from Westphalian pits to Holland is 100 marks, the pit-mouth price of coal works out at 1,420 marks for Westphalian coal exported to Holland and at 1,496 marks for coke. If these prices are taken as the basis, and account is taken of the quantity of coal and coke needed to produce the requisite quantity of pig-iron and its transformation into bars, a consumption of 750 kilos (1,650 lbs.) of coal and 2,000 kilos (4,400 lbs.) of coke is arrived at. At the prices quoted this means an expenditure of 1,065 marks for coal and 2,992 marks for coke, or a total of 4,057 marks per ton of steel. At least 500 marks have to be expended for ore and additions at present prices, so that the result is a total of 4,557 marks per ton of steel bars. If the steel is sold in the Dutch market, as already stated, at 4,370 marks the ton, a present of 187 marks per ton is made to the foreign importer, without reckoning all the wages incidental to the smelting of the ore, turning the pig-iron into steel and rolling this into bars, and without taking into account the expenditure for furnaces, tools, moulds, rolls, etc., incidental to the production, and, of course, without any allowance for overhead charges. As a consequence, the price realised is scarcely that obtainable for the quantity of coal and coke used in the production of a ton of bars, if the same quantity of coal and coke were placed on the world's market as coal and coke pure and simple. Exports conducted on this basis would imply the placing of German labour free and gratis at the disposal of other countries without any return, and there might be an apprehension that this state of affairs prevails to a greater extent in the case of highly-finished articles, although it is more difficult to prove the point in their case than it is for syndicated steel bars. At first glance—the newspaper remarks—the conclusion might be drawn that it would be more advantageous to export raw materials, more particularly coal, than to transform them into manufactured articles first and then to export them. Such a course, however, is barred by the fact that the Germans themselves are suffering from a scarcity of coal, that they have to deliver considerable quantities to France and other countries under the Peace Treaty, and that any increased export of coal would further curtail the production, already restricted, of iron. This would lead to an increase in unemployment, and all its disastrous consequences, and be tantamount to the renunciation by the iron and steel industry of the position in the world's market which it had gained after years of hard work, and for regaining which it must fight afresh. The chief aim therefore must be to stop all uneconomic exports, and take care that the highest possible prices are obtained for exports that are procurable, having regard to the present situation of the world market. Under any circumstances, the constant underselling in foreign markets of non-syndicated products by German works and merchants, which still further depresses prices, and which gives rise to foreign complaints of dumping, must cease. The question of the production of coal as affecting the problem is next discussed. It is pointed out by the paper that the present average daily output in the Ruhr Basin is 250,000 tons, as compared with 365,000 tons before the War, the deficiency of 115,000 tons per day representing a loss of 33,000,000 tons per annum. If a market price of only 1,200 paper marks is assumed for this quantity—a price, as already stated, below the world's market price—the value of the loss in the production of 33,000,000 tons is computed at 40,000 million paper marks, or, say, 3,000 million gold marks. What this sum represents will be realised if we bear in mind that the maximum value of German exports prior to the War amounted to 10,700 million marks, and that it would therefore be possible to reach one-third of this value if it were possible to raise the output of coal to the pre-War level and export this additional 33,000,000 tons. Of course, it will not be possible to export any larger quantity at present, for the reasons already stated. The figures quoted, however, only apply to the region of the Ruhr. If the production could be increased in the other districts also, it is contended that the Germans would be able to free themselves from their own pressing necessity, and probably additional quantities would be available for export for the improvement of the country's trade balance and the effective improvement of the currency. It is therefore considered to be doubly regrettable that the Germans are unable to take advantage of the present highly favourable situation of the world's coal market, especially as this cannot last for any length of time, for shipbuilding is expanding greatly abroad, and as soon as more ships are available freights and coal prices are bound to come down in the international market. The Cologne paper, in conclusion, discusses the unrest among miners, suggests a provisional return to the 8-hour shift so as to increase the production, and asks the coalowners to pay higher wages and premiums for the working of extra hours. At the same time, it would be of no use to increase the output so long as the railways are unable to improve their present transport arrangements, and the State railways are therefore urged to appeal to their employees to make greater efforts to bring about an improvement in the services.

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The report for the year to August 31st states that the profit and loss account shows a credit balance of £16,208, which, subject to income-tax, excess profits duty (if any), and increment value duty (South Africa), the directors recommend should be carried forward. The property account now stands at the reduced figure of £52,166, the sums realised by the sale of land previously reported having been credited to this account. The remaining land holdings of the company represented by the above sum aggregate approximately 186,988 acres in the Transvaal, an undivided moiety of about 43,000 acres of land in Southern Rhodesia, known as the "Kanya Block," and mining concessions in the Bangwaketsi reserve of the Bechuanaland Protectorate, giving rights of selection for mineral exploitation over an area of about 9,000 square miles of territory. The mineral rights over the land sold are also included under the above heading, these having, in the main, been reserved to the company. Sundry investments stand at £25,827, as against £32,503 last year, some important realisations having been effected at prices considerably in excess of book values. Loans and sundry debtors, including various sums secured on land sold and repayable by instalments, amount to £27,299. Investment in War Loan stands at £9,475, and cash at bank £12,223. Altogether the liquid assets, or assets capable of easy liquidation, total £74,824, apart from the land and mining rights. The demand for land in South Africa continues, and since the close of the financial year further sales aggregating upwards of £9,000 have been made. Offers for other large areas have been submitted and declined. All mineral rights have been reserved to the company, except in one case, where 75 per cent has been retained. No further work on the deposits of corundum, referred to in the last report, has been carried out, as the demand for this mineral practically ceased on the conclusion of the armistice.

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Notes and News.

Sale of Imperial Surplus Stores.

The Disposal Board of the Ministry of Munitions has an important advertisement in another part of this issue regarding the sale of surplus War stores. Vast quantities of excellent material and equipment of all kinds are now available, and the opportunity should not be missed by enterprising business men.

* * * *

African Oils.

Latest reports from the African Oils is to the effect that drilling has proved the continuity of the shale bed in depth, and that approximately four million tons of shale have been partly developed. The option granted to a well-known firm in England has been extended at the request of the latter.

* * * *

The Messina Smelter.

The new copper smelting company being formed by the Messina Company—to turn the Messina concentrates into copper—will have a capital of £10,000 subscribed by the parent company. Mr. E. C. Emery, the local director of the smelting company, will have a five per cent. interest with two other officials of the company, who will be the directors in South Africa.

* * * *

Greig Diamonds.

Greig Diamonds have been a market feature during the week. The capital is £16,000 in 5s. shares, of which £2,000 is working capital. £11,000 in shares has been issued to vendors, and there is a reserve of 12,000 shares. The directors are Messrs. H. J. Filmer, A. W. Bantjes, T. Greig and J. W. E. Schumann. The company holds leases of 50 alluvial diamond discoverers' claims and 100 owners' claims from the Village Council of Schweizer Reneke, besides various other freehold interests in a number of farms in the Wolmaransstad district, and as a landlord concern is earning a large and increasing revenue, and a dividend is expected to be declared shortly.

* * * *

Majunga Oilfields of Madagascar.

This company went to allotment in London on January 17. Mr. John Martin and Mr. W. S. Forbes proceeded to Madagascar by "S.S. Kinfauns Castle" on the 23rd ult. Orders for machinery and equipment have been placed and Mr. A. V. Ireland is sailing for America at once to supervise their despatch. Delivery of the machinery is expected in Madagascar within ten weeks, when boring operations will immediately commence. Experts have been engaged on specifications of the distillation plant, but as the property has yet to be developed this seems a little premature.

* * * *

The Leicester Mine up for Tender.

His Excellency the Governor-General, under the powers vested in him by Section 44 of the Precious Stones Act, 1899, of the Cape of Good Hope, has decided to lease the exclusive right to mine for precious stones the whole of the abandoned diamond mine known as the Leicester Mine, situated on the farm "H.V. 8," in the Barkly West Division of the Province of the Cape of Good Hope, and the Government is therefore prepared to accept applications for the leasing of the right in respect of that area. The proclaimed area of the mine is 13 morgen 199 square roods and 55 square feet approximately, equivalent to 1,417 claims (30 by 30 English feet), but no responsibility will attach to Government should the extent of diamondiferous ground be found, on further development, to be less than the area stated. The consideration to the Government to be quoted by the applicant shall be a royalty of not less than one pound per centum on the gross amount realised by the sale of precious stones yielded by the property leased, as prescribed in Section 44 of the Precious Stones Act, 1899. The cash capital that shall be regarded as sufficient for the proper working of the mine shall be £75,000

Successful Publicity.

A feature of the recent Special Coal Number issued by this journal was the publicity display made in its advertisement pages by the well-known firm of Messrs. John Tullis & Sons, Ltd. In an issue where almost every advertisement was of an exceptionally striking and attention-compelling nature, the artistic and forcible appeal to the eye of the reader made by Messrs. Tullis stood out pre-eminently. All concerned are to be congratulated on the result, which, we trust, will prove a good example to other prominent and progressive advertisers. Credit for the design and execution of the work, it should be mentioned, is entirely due to local talent.

* * * *

The Government and Currency Reform.

From the speeches made by General Smuts and Col. Mentz during the week we gather that the Government has decided upon a scheme to stabilize the currency and banking system of the Union. From the hints dropped by Col. Mentz it would seem that the Treasury Gold Certificate proposal made by Mr. H. Strakosch is favoured, and doubtless the establishment of a Reserve Bank will follow as a natural corollary. The Currency Advisory Committee—of which Mr. Strakosch is a member—appointed by the Government met at Pretoria this week, and there is reason to believe that it has been able to come to an agreement in regard to the best course that should be adopted by the Government and embodied in legislation to be introduced in the next session of Parliament. It is unnecessary to emphasise the importance of this news to every department of finance and commerce in the country.

* * * *

Montrose Diamond Mining.

The directors of the Montrose Diamond Mining Co., Ltd., state that they have secured the services of Mr. J. M. Calderwood, M.I.M.M., and Mr. F. L. Chambers, M.I.M.M., M.I.M.E., to act as joint consulting engineers. These gentlemen have placed before the directors a satisfactory scheme of operations for overhauling the machinery and plant, the treatment of mined material, and the further development of the property, which will be forthwith inaugurated. The engineers estimate that about 60,000 loads of cylinder lumps and tailings are available for immediate treatment in addition to about 5,000 loads of partially weathered blue ground. In their opinion the initial work involved in the improvement of the machinery to bring it up to date can soon be completed, and that, in view of the enhanced value of diamonds, and allowing for recovery on a conservative basis, " there is a safe assurance that profits will be made practically from the start."

* * * *

Progress at the Sub Nigel.

At the end of December the total depth of the new shaft at the Sub Nigel was 2,567 feet and sinking should be completed by the end of January. The crosscut on the 17th level (2,000 feet vertical depth) has been driven a total distance of 80 feet from the direction of the new shaft and about 850 feet from the connection with D shaft workings. A further 1,500 feet remain to be driven on this crosscut before the new shaft and the D shaft workings are connected. Work is proceeding from B shaft eastwards on the 15th and 18th levels to prove the chute located on the 16th level. The drive westwards on the 18th level in C shaft has encountered what may be the main downthrow dyke between C and D shafts. The true correlation of this dyke will be proved by boring in due course. The crosscut from D shaft workings on the 17th level has passed through a small dyke causing an upthrow of the reef measures of about 100 feet, and this may necessitate a slight change of programme in the scheme for developing the lower levels to the west of D shaft. On a rise between the 12th and 13th levels east of D shaft exceptionally good values have been exposed over some 140 feet. The average number of natives employed during the quarter was 1,071 as against 1,249 for the previous quarter. The company has felt the effect of the labour shortage very seriously during the quarter, but there has been a recent improvement in this connection which it is to be hoped will continue.

The Hours' Question on the Mines.

The second strike ballot arising out of the refusal of the Chamber of Mines to grant a reduction of hours to 40 underground and 44 on the surface has been taken among all the mine workers on the Reef, and was returnable on February 26. The question submitted on the ballot paper was as follows: " Are you in favour of rejecting the offer of the Chamber of Mines of £2 8s. per week increase consolidated, on the present rate of wages, with the present hours, and striking immediately for a 40-hours' week for underground workers and 44-hours for surface workers? " A majority of " Yes's " will mean a strike, and of " Noes " no strike. The matter affects the V.F.P. and Rand Water Board employees, it being understood that they will fall into line with any action taken by the mines. The Union Steel Workers and the Vereeniging Brick and Tile Works are also concerned in any settlement reached on the mines. The Joint Executive, we learn, recommends the acceptance of the £2 8s. increase, and that the reduction of hours be not insisted upon at the present juncture.

* * * *

Tin Soaring in Price.

The record price of £410 5s. for cash and £412 10s. forward delivery for tin is recorded in a cable from London, dated February 23rd. This tremendous price must have a very beneficial influence on cassiterite mining concerns all the world over, and it will of course favourably affect the position of South African concerns. Take Rooibergs, for example. This company had accumulated 13,108 short tons of ore at the end of 1919, and at an average of 2 per cent. metallic contents the value of this ore at present price works out at about £110,000. Returns from Leeuwpoort, Zaaiplaats, the Swazi Tin areas and other concerns should also improve materially. Messrs. Henry Bath & Sons, Ltd., in their fortnightly tin report, dated February 3rd, 1920, state of the position in regard to tin: Stocks generally are in an attenuated condition and the market sentiment seems to favour still higher prices. Tin ores are however in plentiful supply, greater indeed than the smelters can handle, and returning charges are consequently at a record high level. Official quotations: Standard tin: 2nd February, 1920, cash £383 15s. to £384, three months £384 5s. to £384 10s.; 16th January, 1920, cash £376 5s. to £376 10s., three months £377 10s. to £377 15s.

* * * *

The Future of Silver.

The proportionate rise in silver has been very much greater than that of gold, since it was quoted at over 88d. per ounce a few days ago, whereas before the War it had at one time fallen to as low as 22d. per ounce. The reasons for the increased value put upon silver as compared with gold are many and complicated, but they all come back in the end to the old simple rule of supply and demand. The supply has diminished—mainly in recent years owing to the closing of the Mexican mines and the exhaustion of other sources—while the demand has increased, not only for purposes of subsidiary currency, but also owing to the fact that the generally unsettled conditions have accentuated the traditional tendency to hoard silver in India and the Far East. The two circumstances combined have resulted in a general shortage, and the question raised is as to what can be done to provide a metallic subsidiary currency which would be acceptable and at the same time would not be intrinsically worth more than the face value stamped upon it. The expedient of issuing paper notes of very small denomination has been proved a failure. It may be said, indeed, that it has been the adoption of this alternative that has been largely conducive to the utter demoralisation of the currency of Germany and Austria, so that the value of the mark and the crown has sunk so low as to become almost nominal, the exchange value being very little more than the cost of the paper and printing. As is pointed out in the weekly bullion circular of Messrs. Samuel Montagu & Co., the German Reichsbank is offering to pay in paper currency for silver coin six and a-half times its face value. Such an offer is a confession of weakness, but if it were not for the difficulty of smuggling the bullion out of the country a very much higher premium would have to be paid.

The mark contains nearly as much silver as the English shilling and is worth quite twelve paper marks. In other countries different methods have been adopted, the most practical being the reduction of the quantity of silver in the coins, which is now being done, we believe, in Canada and the Malay States and is proposed in the United States, and the introduction of nickel coinage.

* * * *

Eldorado Banket.

The Eldorado directors present report and accounts covering the period of eighteen months to September 30 last, giving detailed information of results to as recent a date as possible in view of the cessation of operations and the impending liquidation of the company. The profits on the operations for the period, including accumulated gold reserves, amounted to £98,097, which added to £63,785 brought in, and including balance of renewals and replacements fund, viz., £3,811, makes a total of £165,693. Three interim dividends of 1s. 6d. per share each, together equal to 22½ per cent., and the directors' percentage of profits, £1,500, have been paid, leaving to be carried forward £96,,693. It was explained at the last annual meeting that, failing new discoveries of importance, the period during which the mill could be kept running depended entirely on the quantity and grade of excess ore that might become available. The last of the ore was withdrawn from the mine at the end of June, and the mill was kept running intermittently until the end of August. During September a first general clean-up yielded gold to the value of £27,340, and since the accounts were made up a further clean-up has yielded gold value £3,384. As the plant has been in operation for a number of years it is anticipated that there will be a further recovery of gold from the final clean-up which will be made all round the battery and plant during its removal. Satisfactory prices have been obtained for the plant and the claims held by the company. The time having now arrived for putting the company into liquidation, a resolution will be submitted for this purpose after the ordinary business at the forthcoming meeting of shareholders.

* * * *

Trans-Zambesia Railway.

An offer for sale at 93 per cent. is announced in London of £1,200,000 6 per cent. first mortgage debentures of the Trans-Zambesia Railway Company, Ltd. Interest is guaranteed by the Government of the Nyasaland Protectorate for twenty-five years, and the annual sinking fund of £30,000 required to redeem the whole of the debentures by forty annual drawings, commencing in the sixth year after the issue of the debentures, is guaranteed by that Government for the first twenty years. The company will construct a railway under a concession from the Companhia de Moçambique in Portuguese East Africa; 165 miles will be constructed between the southern bank of the Zambesi River, opposite the terminus of the Central Africa Railway on the northern bank, and a point on the Beira Junction Railway thirty-five kilometres from Beira. The Trans-Zambesia Company will have running rights into Beira, with terminal facilities and access to wharves and quays. The chairman, Mr. Libert Oury, points out that, at the expiration of twenty-five years there should be a balance of only £600,000 of bonds in existence, representing a capital charge of £218 per mile. The net earnings of the Shiré Highlands Railway, one of the links in this system of railways, were for 1917 at the rate of £281 per mile, and for 1918 at the rate of £292 per mile. The traffic of this line, as well as that of the Central Africa Railway, will almost entirely pass over the Trans-Zambesia railway, which will immediately serve the rich territory of British Nyasaland, North-Eastern Rhodesia, and the Zambesi Valley, in which are situated important deposits of coal and large sugar and other factories. In the near future the line will undoubtedly be an important link in the Cape to Cairo route. The company can thus confidently look forward to substantial receipts, and the net earnings should exceed the amount required to meet the service of the debenture issue long before the expiry of the guarantee.

TOPICS OF THE WEEK.

THE FAILURE OF THE NATIVE STRIKE.

What Mr. H. M. Taberer has described as the "enormous imitative propensity" of the native has been well displayed in the progress and failure of the native strike along the Reef. For the time being the strike fever has subsided, but there can be little doubt that the natives have learned the value of the strike weapon from the white man and that we must anticipate a repetition of its use in future. In addition to the example of the white men, profiteering by mine concession stores must also be set down as a direct cause of the trouble of the past ten days, and it is high time that means were devised to clip the wings of those responsible under this head. The fact that the strike has not proved more general and serious—it never affected a quarter of the number of "boys" on the Rand at one time—is doubtless due to the precarious food position in the native territories. Had the famine and mealie shortage in those districts been less pronounced it is possible that things might have been far worse. As it is, however, there can be no doubt that one result of the events of the past few days will be to call more attention to the place of the native in the industry, and to strengthen the case for those who claim, like Mr. Taberer, that the native must be treated differently if the best results are to be got from his efforts. Only the other day Mr. Taberer declared publicly: "When the natives realise their power to obtain their just demands, there will be a far greater dislocation in the working of the mines than there ever can be through a strike by European employees, for not only can the former live longer on their own natural resources than the whites can (and many of them can obtain temporary employment elsewhere), but, as it is probably needless to point out, when such action is taken very many impossible demands will be promulgated along with the reasonable, and the granting of the latter will naturally give rise to a precedent creative of unending attempts to obtain concessions." This prediction has, unfortunately, been largely justified, and it must now be the duty of those responsible to provide against its being fulfilled in its entirety. The case made out by the Chamber of Mines in reply to the native demands could not be bettered, as far as it went. It is true that the mine native, being housed and fed by the mines, has not the same grievance on the score of increased cost of living as has the white man. On the other hand, as the Chamber points out, he has had his rate of pay advanced on an average by something over 3d. per shift, at a cost to the industry of approximately £650,000 per annum. Dealing with the belief that the removal of the colour bar would meet the natives' grievance, the Chamber says it should be clearly understood that the removal of the colour bar, even if it were possible, in opposition to the wishes of the great bulk of the European population of the Witwatersrand, would benefit only the comparatively small number of skilled or semi-skilled natives; to the great mass it would make no difference whatever. Again, the Chamber points out that the natives seem to be far from clear as to the exact increase which they desire, but the smallest amount suggested by any of them is an increase of 3s. per shift. This would mean an additional expense to the industry of over eight million pounds per annum, which it obviously cannot afford. Even with gold at £5 7s. 6d. per ounce, the additional wages would mean that 23 mines employing 9,680 Europeans and 75,176 natives would be unable to continue. "When the premium disappears, as it must do sooner or later, only eight of the mines could pay the increased wages; and these would be entirely unable to carry alone the burden of phthisis compensation and water charges. In short, the whole mining industry would be rendered unpayable." It must be admitted that the Chamber has made out an unanswerable case against any increase of native pay in the present circumstances. Where it does not convince, however, is in regard to the removal of the "colour bar." The very fact that, according to the Chamber, a comparatively small number of natives would be benefited goes to prove the desirability of effecting a small reform to right a big wrong.

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THE OUTLOOK FOR POSTMAS DIAMOND PROSPECT.

Large Mine in Course of Development—"A True Pipe"—Vigorous Working Policy—Favourable Report by Dr. Merensky.

CONSIDERABLE interest is being taken in the progress of work at the property of the Postmas Diamond Prospect, Ltd., about which some particulars have recently appeared in these columns. It may be recalled that the Postmas Diamond Prospect, Ltd., was incorporated in the O.F.S. and registered at Bloemfontein on the 22nd November, 1919, to acquire certain option of purchase over the farm Bishop, district of Kuruman; and certain prospecting areas pegged under licences on the Postmasburg Commonage (Crown lands), Cape Province. The nominal capital of the company is £50,000 in 400,000 shares of 2s. 6d. each. 280,000 shares have been issued to the vendors in full settlement of all their rights and interests acquired under the vendors' agreement, and 60,000 shares have been subscribed for at par by the promoter. The remaining shares are held in reserve and are under option to the promoter at par for two years from date of registration of company. The chairman of the company is Mr. J. Dale Lace, and the other members of the board are Messrs. A. Langebrink and L. Edwards. The company's auditor is Mr. J. S. Richardson, of Stock Exchange Buildings, Johannesburg, and the secretary is Mr. T. L. Day. The office of the company is situated at Lace Building, 74 Fox Street, Johannesburg. Subsequently to its formation the company acquired further prospecting areas (Crown lands) on the Postmasburg Commonage, and now holds in all 25 such areas, on which two diamond mines of considerable area have been discovered. The first was discovered on the 14th November, 1919, and the second on the 24th December, 1919. Operations have disclosed the presence of diamonds of excellent quality. At the larger or No. 1 mine—which Dr. Merensky describes as "a true pipe"—development is actively proceeding, no less than fifteen shafts now being sunk in clean yellow, and these have reached depths varying from thirty to fifty feet. Four adits have also been put into the hill, and from forty-five loads washed fifteen stones, equal to a total of 8½ carats, have been recovered. The No. 1 mine is situated a little over a mile from the West End mine, which has of late been developing in a very promising manner. The accompanying photograph shows the No. 1 mine on the right of the picture with the workings clearly indicated in the foreground and round the base of the eminence. The area promises to give a mine of a very large claim area, according to the indications from the present shafts and adits. Dr. Merensky has made a highly encouraging report from which the following is taken:

POSTMAS DIAMONDS: NO. I. MINE ON THE RIGHT OF THE PICTURE, SHOWING WORKINGS IN FOREGROUND.

> The two diamond mines of the Postmas Diamond Prospects Syndicate, Limited, are situated in Griqualand West, some 120 miles west of Kimberley, close to Postmasburg. This village is connected with Kimberley, the nearest railway station, by a fairly good road.
>
> The Company's mines are located on areas pegged under Government Licence on the Commonage of Postmasburg, which is Government ground. Of any diamond mines exploited thereon, the Government's share in the net profits is 50 per cent. The corresponding percentage in the case of the Orange Free State is 40 percent., and in that of the Transvaal 60 per cent. A specially favourable feature is that no purchase consideration falls to be paid in respect of any discoveries on the Commonage, there being no private owners to be reckoned with.
>
> The topography of the country round Postmasburg consists of alternating valleys and ridges having a North-South trend. The village and mines are situated on an extensive depression which is covered with poor vegetation. The dolomite formation is outcropping here; it lies fairly flat, while on the flanks, east and west, it is overlain by the lower beds of the Pretoria series (Griqualand Series). As is known, the dolomite forms the main reservoir for underground waters. In the valley of Postmasburg the formation is traversed by powerful dolerite dykes which constitute deep-seated natural dams, along which water can be found in large volumes, as may be evidenced from the flourishing gardens at Postmasburg in this otherwise arid country. The occurrence of diamondiferous kimberlite in this area has been known for a long time; instancing the Peiser and Makganyene Mines, which are respectively situated 18 miles south-east and 17 miles north-west of Postmasburg. Prospecting in this locality is rendered difficult owing to the high contents of lime in the formation, together with the fact of the limited rainfall favouring the formation of an extensive superficial crust of calcareous tufa and hard lime breccia. To this fact must be ascribed the reason why the discovery of the West End Mine so close to Postmasburg was made only about a year ago, and in the case of the two mines under report, so recently as the 14th November and 24th December last year respectively.
>
> The two mines of the Postmas Diamond Prospect, Ltd., are situated 2½ and 5 miles respectively north-east of Postmasburg and the West End Mine.
>
> Mine No. I. is located between a well-defined valley and a conspicuous hill. The valley owes its presence to a dolerite dyke having a strike from north-east to south-west. In a shaft sunk upon this dyke a strong influx of water has already been encountered, amply sufficient for present necessities. The hill, which is known by the name of "Blinkklip," is covered by a brecciated chert carrying a high proportion of hematite. The mine, as at present disclosed, is situate on the southern face of the hill, its southern wall being flat-lying typical dolomite. During the short time which has elapsed since the discovery of the mine a comparatively large amount of work has been done. Observations are thus afforded in prospecting shafts varying in depth from 10 to 50 feet, and in four long cuttings directed towards the hill. These cuttings are being pushed along as incline shafts for the opening up and development of the mine. The occurrence of kimberlite here has so far been proved from south to north over an approximate area of 6 claims in breadth, and about 40 claims in length in an east-west direction. But judging from surface indications a much larger claim area may be looked forward to. The yellow ground exposed is much hardened and altered at the surface by percolating lime waters, conditions which will disappear at depth, but looks quite promising, particularly in the eastern portion of the mine. The yellow, which, as compared with blue ground, can be treated more economically, will extend to greater depth on this mine owing to the elevated situation of the mine above the ground water level.

Though the shape of the mine so far determined is a markedly elongated one, we have to deal here with a true pipe, as is proved by the following observations, namely :—

(a) The matrix contains numerous rounded and angular fragments not only of the surrounding rocks, but also of rocks belonging to both deeper and once overlying, but now denuded, horizons. This is an experience that never failed me, because in the case of fissures and fissure widenings angular fragments of other horizons are absent. (b) In point of fact the brecciated yellow contains some boulders of fissure stuff which does not show any foreign inclusions. The explanation of this is that a fissure was primarily in existence here, but was subsequently destroyed by the eruption of the pipe. Nice garnets and preponderance of dark green chrome-diopside are characteristic of the deposit, and, above all, diamonds of good quality have been found. In order to further prove Mine No. I., work to ascertain its extent should be continued, and washings of clean and friable yellow ground from depth should be made on a large scale.

Mine II. is situated 2½ miles north of Mine No. I., on the eastern slope of a "Blinkklip" Hill, the conditions being similar to those of Mine I., the slope being here, however, more gentle and the valley less distinct. In the depression deposit was found in calcareous tufa brought to the surface by "meerkats.' In three holes subsequently put down to a shallow depth some distance apart yellow kimberlite was struck. From the experience gained at Mine I. three shafts were then sunk, without having any guidance by surface indications, some 100 yards to the west, and a long way towards the hill, and distributed over a length of 260 feet. In all of these shafts clean yellow has been encountered. This is a surprisingly favourable result. There has not yet been time to arrange for the necessary water supply at this point, and consequently no test washings of the No. II. Mine have been made. Arrangements for the necessary water supply are in progress.

From the present developments on both these mines one cannot but gain the impression that large possibilities exist here for the location of extensive claim areas. Having regard to all the foregoing considerations I look upon Mines No. I. and No. II. as most promising discoveries. (Signed) HANS MERENSKY.

MINES DEPT. EXAMS.—Recent Results.

Managers.—42 Certificates out of 55 in S.A. in a recent 12 months. 23 Certificates (1 conditional) 1919 20.

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Declaration of Dividend No. 30.

A DIVIDEND of Twelve and One half per cent. (12½ per cent.) Two Shillings and Sixpence per £1 share on the issued capital of £210,000, has been declared by the Board for the period ending 28th February, 1920, payable to Shareholders registered in the Books of the Company at the close of business on the 28th February, 1920.

The Transfer Books will be closed from the 1st to the 6th March, 1920, both days inclusive.

The Dividend will be paid as early in April, 1920, as possible.

Dividend Warrants despatched from the London Office to persons resident in the United Kingdom will be subject to a deduction of English Income Tax.

By Order of the Board,

RAND MINES, LIMITED,
Secretaries.
Per A. GREGOR.

Head Office,
The Corner House,
Johannesburg.
21st February, 1920.

G. R.

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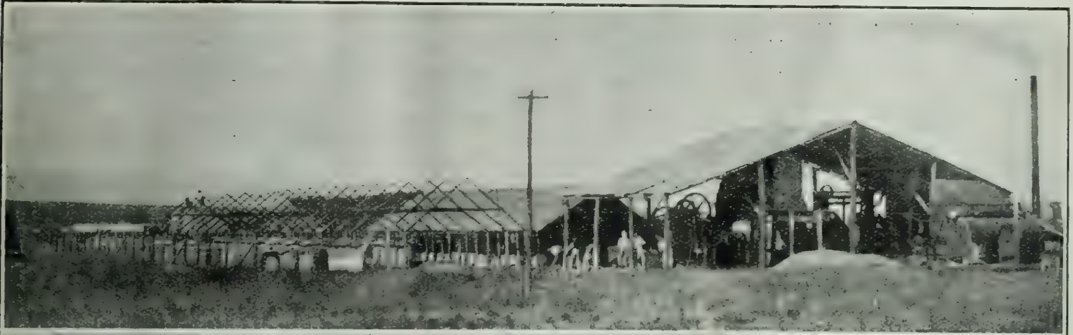
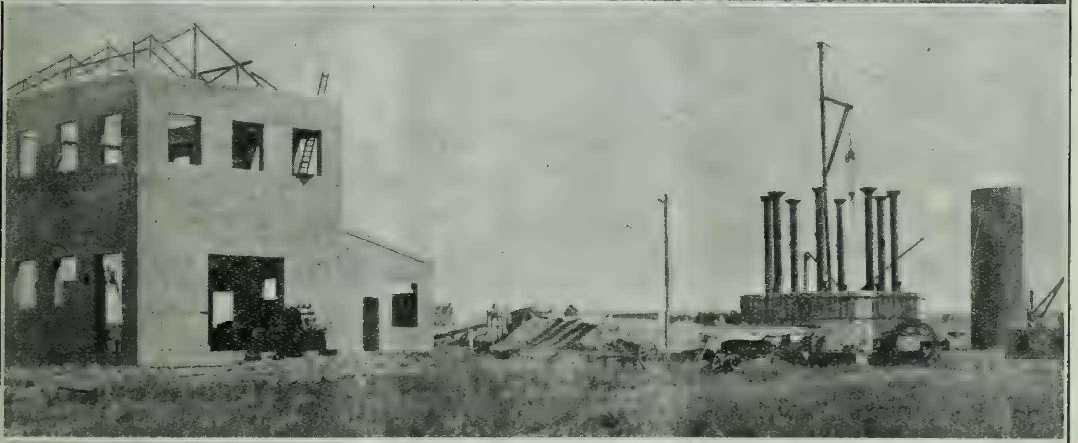
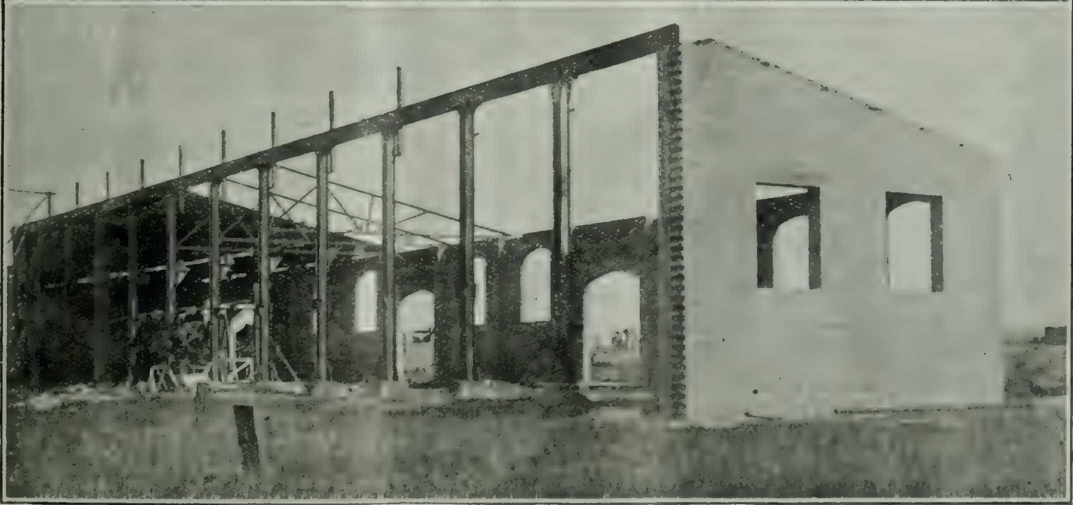
NEWCASTLE IRON AND STEEL LIMITED.

Some Interesting Photos and Analyses—A High Grade Iron Ore.

In our last issue we gave particulars of the Newcastle Iron and Steel, Ltd., flotation. This company is being formed with a capital of £125,000, and we reproduce herewith three photographs illustrating the progress of work on the company's property. We are also in a position to give two very complete analyses of ores from the company's areas. These assays were made by Messrs. Pattinson & Stead, of Middlesborough, England.







1. Newcastle Iron and Steel. The Brick Plant.
2. Blast Furnace in course of construction, showing Sweetwaters Furnace Shell and Engine Room.
3. A Portion of the Foundry and Workshops.

These results disclose a high grade iron ore and foreshadow a successful career for this company, which, by the way, is not identified with any proposals for amalgamation of South African iron and steel interests which may be in progress at present.

The first sample received, January 19th, 1920, consisting of several crushed pieces, was from Dick's farm. It is described as "Soft Iron Ore," and the analysis gave:—

	Dried at 212 F.
Peroxide of iron	86·071 per cent.
Protoxide of iron	Nil.
Protoxide of manganese	0·170 per cent.
Alumina	1·350 per cent.
Lime	0·300 per cent.
Magnesia	0·387 per cent.
Silica	3·830 per cent.
Baryta	Trace.
Sulphur	0·007 per cent.
Phosphoric acid	0·305 per cent.
Titanic acid	0·645 per cent.
Oxide of zinc	Nil.
Oxide of copper	Nil.
Oxides of nickel and cobalt	Nil.
Oxide of lead	Nil.
Arsenic	Trace.
Carbonaceous matter	0·800 per cent.
Carbonic acid	0·400 per cent.
Combined water	6·300 per cent.
	99·988 per cent.
Iron	60·25 per cent.
Phosphorus	0·133 per cent.

Sample No 2, "Hard Iron Ore," from Mountain View, gave:—

	Dried at 212 F.
Peroxide of Iron	80·643 per cent.
Protoxide of iron	5·593 per cent.
Protoxide of maganese	0·267 per cent.
Alumina	1·700 per cent.
Lime	0·150 per cent.
Magnesia	1·261 per cent.
Silica	3·800 per cent.
Baryta	Nil.
Sulphur	0·052 per cent.
Phosphoric acid	0·284 per cent.
Titanic acid	0·060 per cent.
Oxide of zinc	Nil.
Oxide of copper	Nil.
Oxides of nickel and cobalt	Nil.
Oxide of lead	Nil.
Arsenic	Trace.
Cardonaceous matter	Trace.
Carbonic acid	0·550 per cent.
Combined water	5·600 per cent.
	99·960 per cent.
Iron	60·80 per cent.
Phosphorus	0·124 per cent.

The final survey of the route to be taken by the Beira to Zambesi railway is proceeding with all possible despatch. The work (says the *Beira News*) is pretty well advanced from the Zambesi end, while another party has the Beira section in hand. The point of junction with the main line to Rhodesia has not yet been fixed, but it will probably be placed in the neighbourhood of the present Dondo halt, 18 miles from Beira. It is expected that everything will be in readiness for construction to commence soon after the arrival of Mr. A. L. Lawley about April.

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PERSONAL.

Mr. Walter Hudson, of Messrs. Robert Hudson, Ltd., the well-known Leeds firm is on a visit to South Africa.

* * * *

Lt.-Col. H. S. Ebben is leaving the Transvaal Chamber of Mines to take up an important appointment in England.

* * * *

Mr. Ludwig Breitmeyer, a director of De Beers Consolidated Mines, Ltd., arrived at Capetown this week by the "Armadale Castle" from England, and is shortly expected in Kimberley.

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THE NEW HEIDELBERG FLOTATION.

Dr. Sauer's Million and Three-Quarter Company—Mr. Bleloch's Lectures in England—Southern Van Ryn Developments—More Pick and Shovel Work Wanted.

The cabled announcement that Dr. Hans Sauer has succeeded in floating a company with a capital of £1,700,000 to exploit large interests in the extreme south-eastern section of the Witwatersrand gold fields is expected to connote a revival of activity in the region of which Heidelberg is roughly the centre. We say "revival" advisedly. Twelve months ago this journal considered the prospects of this area in a series of exhaustive articles which examined the relative claims of the one and two-reef theories and dealt with the fairly extensive prospecting operations which were then proceeding under the auspices of the Sauer-Bleloch control and which were based on the hypothesis that the Van Ryn Reef was not identical with the thin Nigel ore body as orthodox geologists insist, but that the Van Ryn overlay the Nigel and that the same highly profitable ore bodies which have made the Far East Rand the greatest gold field on earth were to be located in the Heidelberg district at a geological horizon considerably above that of the Nigel. At that time diamond drilling and trenching were proceeding on the farms Eendracht, Tulipvale and Boschfontein and on the Heidelberg town lands, with a view to establishing the accuracy of Mr. Bleloch's assertions, but of recent months the greater portion if not all of this exploratory work has been abandoned, and so far as we can judge the results secured have been negative.

Educating the English.

Mr. Bleloch, however, with characteristic persistency stuck to his stratigraphical guns and despite the restriction of work on the properties with which he is associated published a volume which we reviewed in these columns a few months ago and which reasserted the principles and practice of the two-reef theory with even more emphasis than before. Since the publication of that brochure Mr. Bleloch has proceeded to England and has there been delivering a series of lectures on the potential magnitude of the Greater Heidelberg gold fields and the meaning of the proposition that Van Ryn and Nigel are two separate ore bodies, each of which traverses the area with which he is concerned.

At the Southern Van Ryn.

We have no doubt these lectures have proved intensely interesting and that they have been delivered with Mr. Bleloch's accustomed vigour, although the London financial press hints at some restraint in the lecturer's assertions. However, Mr. Bleloch's visit has aptly synchronised with Dr. Sauer's million and three-quarter flotation, with which Sir Godfrey Lagden and other well-known Anglo-Africans are understood to be associated, and it has moreover corresponded with the obtaining of encouraging developments at the Southern Van Ryn. This latter property, it may be recalled, was inactive a year ago when prospecting operation were being carried out around Heidelberg. At that time there was a considerable difference of opinion between Mr. Bleloch's supporters and the Consolidated Gold Fields directors on the board of the company as to the wisdom of the Gold Fields' policy in sinking a deep level shaft to intersect the Nigel Reef. Mr. Bleloch contended that the Van Ryn Reef was awaiting exploration as an outcrop proposition on the same property. Eventually the Consolidated Gold Fields withdrew, and for some time past operations have been proceeding on the reefs opened up from surface in the earliest days of the company's activity. Recently good results have been obtained from outcrop and sub-outcrop sections at the Southern Van Ryn and these results are taken by the present technical control to signify the vindication of Mr. Bleloch's theories and the unassailable establishment of the two-reef teaching. The company has announced that the following returns apply to the Van Ryn Reef developed from No. 1 incline shaft, north drive. North drive, No. 1 incline shaft at 240 ft., 45 dwts. over 15 ins.; 245 ft., 17 dwts. over 18 ins.; 250 ft., 9·4 dwts. over 24 ins.; 255 ft., 6 dwts. over 26 ins.; 260 ft., 7·3 dwts. over 36 ins.; averaging 13·6 dwts. over 23·8 ins. Individual sections: 32·5 dwts. over 9 ins.; 19·35 dwts. over 12 ins.; 12·25 dwts. over 14 ins.; 11·25 dwts. over 12 ins.; 45 dwts. over 15 ins. The last quarterly report included ·45 dwts. over 15 ins. above. From that point for 40 feet, *i.e.*, from 200 to 240, average assay was 9·5 dwts. over 15 ins.; from 240 to 260 ft., 13·6 dwts. over 23·8 ins.

Correlation versus Development.

These values are decidedly hopeful and we trust that in the interest of all concerned the results will be confirmed by initial development operations on a larger scale. We have never regarded the Southern Van Ryn with favour when considered in terms of the Nigel Reef. That ore body lies in the Southern Van Ryn at a very considerable depth, and this fact in conjunction with the known thinness and erratic character of the reef in adjacent mines does not make the Nigel a very attractive proposition at 4,000 or more feet from surface. But the presence of values does not necessarily establish a correlation between the near surface banket sections in the Southern Van Ryn and the reefs worked so successfully in say the New Modderfontein and Van Ryn Deep properties. These Southern Van Ryn values are, however, encouraging. We hope that they will continue, and we trust too that the policy of proving inch-pennyweights will be persisted in both by the Southern Van Ryn and by Dr. Sauer's new flotation rather than the unsatisfactory method of demonstrating the wealth of a claim area by correlative principles. As we have frequently stated in previous issues of this journal, the basal fact is that if a reef contains gold in profitable quantities and is continuous, the particular name bestowed upon that reef is of little concern or interest. But here along the line of the Witwatersrand formation there are certain developments of the conglomerate beds which have proved so immensely profitable to work in the past that if geological authority sets the seal of identity between these reefs and others, company flotation is made easy in respect of these latter deposits and actual development is not required to see the shares quoted at a good premium on the market. There is abundant room for the activities of the various Heidelberg enterprises, and whilst this journal discourages carping criticism of geological theories, we shall welcome pick and shovel work and not correlation in the Greater Heidelberg areas as being in the best interests of the country at large and also as the only satisfactory means of determining the economic solution of the one, two or three payable reefs controversy.

On the Wilgepoort Line.

Meanwhile arrangements are being made for the early prosecution of the properties acquired by the Coronation Syndicate from the Far East Rand South Selections Company and others at the promising Wilgepoort section and elsewhere. The word Coronation, when applied to a mining enterprise, has an unpleasant sound to many ears, but there appear to be sound reasons for believing that the once famous company may yet have a successful career in its new fields of activity. Greater Heidelberg would indeed seem to be coming into its own again to some degree. But the district has proved very disappointing in the past and only sound and intelligent work can make its new-found popularity enduring.

Witwatersrand Deep.

The development for the month of January, 1920, was as follows. Total footage developed, 390; footage sampled, 245; reef width, 39 inches; reef value, 11·7 dwts.; inch dwts., 456; payable footage sampled, 195; percentage payable, 79·6 per cent.; inch dwts., 553.

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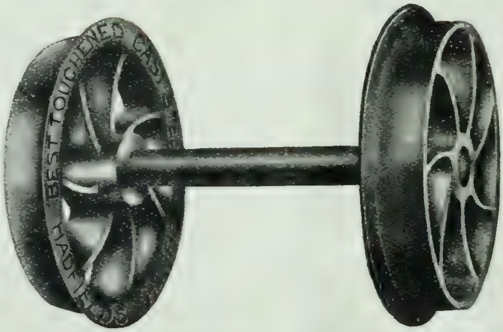

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PROGRESS AT THE UNION CORPORATION'S SUBSIDIARIES.

The Geduld Company's New Shaft—Syenite Dykes Delay Sinking—The Importance of "No. 7" for Geduld's Future Policy—A Huge Mine with a Small Mill—Pushing on with Main Haulages at Modder Deep—The Princess Company's Bad Luck.

When the difficulties encountered in connection with the work are considered it is clear that good progress has been attained in sinking the new shaft at the Geduld Proprietary Company's large property. At the end of January this shaft had reached a depth of 294 feet and the depth at date is well over 300 feet.

The Syenite Dykes.

Progress has been hampered by the presence of horizontal syenite dykes which are of such great hardness that in mining parlance it is "difficult to get steel to stand up to them." To encounter a syenite band in the dolomites is common experience in shaft sinking on the Far East Rand, but the new Geduld shaft has been unlucky enough to meet with three of these occurrences. Judging, however, from the experience of the New State Areas, the syenite formation is now practically pierced and better progress should be obtained from now onwards.

The Surface Installations.

A good deal of surface work has already been completed in connection with the installation at this shaft. All the initial machinery required has been completed and has been bricked in. An efficient boiler plant has been installed. The compressor and temporary winders have been erected for some time and work in connection with the permanent winders is well advanced.

An Important Point of Attack.

This new shaft will be of the utmost importance to the future operations of the Geduld Company, and a few words in regard to its uses and functions will not be out of place here. In all there are now seven shafts on the property, but only two of these have been carried down to the reef, the majority of the pits sunk when the present Geduld consisted of a number of companies having been stopped before they penetrated to the banket horizon. Of the two shafts on the reef at the present time one only is supplying the requirements of the battery and the other is used for pumping and baling and as a ventilation outlet.

The Expansion Project.

The new shaft, which is known as No. 7 and which will exploit a large portion of the company's southern area, will therefore prove of the greatest importance to the company in any scheme of expansion which may be decided on in the future. It is anticipated that the reef will be cut in this shaft at a depth of about 2,400 or 2,500 feet. After intersecting the reef the shaft will be continued and long crosscuts will be carried in to the ore body. The future milling policy of the company will, of course, be determined by the results of development undertaken from this shaft, but it will be readily appreciated that the Geduld Company with its mining area of 2,181 claims is very modestly served by a battery of a capacity of not much over half a million tons a year.

Latest Results.

Recent returns of this company have been as follows:

		Revenue.			Cost.		Profit.		
1919.	Tons.	£	s.	d.	s.	d.	£	s.	d.
July	43,700	65,500	30	0	20	2	21,117	9	8
August...	42,800	64,914	30	1	20	8	20,004	9	1
September	42,500	64,523	30	1	20	11	19,680	9	3
October	41,600	67,454	30	3	20	9	20,954	9	5
November	44,200	68,452	30	4	21	2	21,345	9	8
December	43,500	67,734	31	2	22	9	18,019	8	.
1920.									
*January .	45,000	89,943	40	0	22	8	38,887	17	4

* Revenue calculated at £5⅜ per fine oz.

Position of Modder Deep.

At the Modderfontein Deep Levels development is being pushed forward gradually but steadily. Main east and west endless rope haulages are now being driven out to the boundaries of the property. The western haulage is practically finished and the eastern haulage will be completed this year. These undertakings will result in a substantial saving in tramming costs. The mine is looking particularly well at the present time and returns for the past seven months have been as under:

		Revenue.			Cost.		Profit.		
1919.	Tons.	£	s.	d.	s.	d.	£	s.	d
July	43,500	95,842	43	11	17	9	56,958	26	2
August. . .	41,300	91,700	44	5	19	2	51,742	25	1
September	42,500	94,920	44	8	18	10	54,645	25	9
October	44,400	98,475	44	4	18	7	57,027	25	8
November	40,700	94,100	46	3	19	8	53,863	26	6
December	41,100	98,186	47	4	21	1	54,789	26	8
1920.									
*January	44,000	125,103	56	10	21	0	78,854	35	10

* Revenue calculated at £5⅜ per fine oz.

At the Princess.

Up to the time of writing neither Geduld nor Modder Deep had been affected by native labour troubles. The other productive concern of the group, however, the Princess, had its natives on strike from Thursday of last week up to Tuesday morning of this week, and the February results will be affected accordingly. This is singularly bad luck, as the Princess, which has been short of labour ever since the influenza epidemic, appeared to be at last turning the corner and the returns of the company up to the 19th of this month, when the natives downed tools, were the best secured for a long time past.

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THE CONSOLIDATED DIAMOND MINES OF S.-W. AFRICA.

Chairman's Explanation of the Aims and Objects of the New Combine.

THE Consolidated Diamond Mines of South-West Africa, Ltd., has been incorporated in the Province of the Cape of Good Hope. The following constitute the board of directors: Hon. H. C. Hull (chairman), Sir David P. de V. Graaff, Bart., Messrs. Ernest Oppenheimer, Andrew Wilson Tait (alternate, W. E. Hudson), C. Lyall Dalziel, Dr. E. Lubbert, A. Stuch, W. Bredow, and Carl Weiss. The chairman of the board, Mr. Hull, has issued the following memorandum:

A company bearing the above name was registered in Capetown on the 9th day of February, 1920, under the Company Laws of the Province of the Cape of Good Hope, and the following are short particulars of the constitution, the objects and other matters relating to the Company :—

1. The registered capital of the Company is £4,500,000, divided into 4,500,000 ordinary shares of £1 each, apportioned as follows: (a) 1,775,000 fully paid shares to the Vendor Companies, being part of the purchase consideration payable to them. (b) 1,850,000 shares set aside to meet the right of conversion to which the holders of the debenture issue of £1,850,000 (hereinafter more fully referred to), are entitled. (c) 125,000 shares will be issued at par to the Anglo-American Corporation of South Africa, Limited. (d) 9,000 shares at par to the subscribers of the Memorandum. (e) 741,000 shares in reserve.

2. The objects of the company are, *inter alia*, to acquire and work diamondiferous areas and mines in the South-West Protectorate and elsewhere, and in particular to acquire certain alluvial and other fields in the South-West Protectorate belonging to the German companies whose names are set out below, and to adopt and take over the benefit of and obligations under the following agreement: (a) An agreement dated the 23rd November, 1919, as amended by Deeds of Agreement dated respectively the 24th November, 1919, and 5th February, 1920, and made between August Stauch, Doctor Erich Lubbert and Walter Bredow, as the representatives of the diamond mining, trading and other companies therein mentioned, of the one part, and the Honourable Henry Charles Hull, on the other part. (b) Two Agreements, one between the South-West Investment Company, Ltd., and the Consolidated Diamond Company, and the other between the Consolidated Diamond Company and the South-West Electric Power Company, Limited. Under these agreements the Consolidated Diamond Company becomes the owner of substantially all the principal diamond producing fields in the South-West Protectorate, together with the machinery, plant and equipment belonging to those fields. The plant and equipment are of up-to-date type, in good working order, and are of more than sufficient capacity to meet all the requirements of the Consolidated Company. Included also in the purchase are the railway line, engines, and rolling stock of the railway between Luderitzbucht and Bogenfels which serve the fields in that area. It is obvious that this consolidation of mining and other interests must conduce to more efficient management and result in substantial economies in working.

3. The German companies whose several undertakings and assets the Consolidated Diamond Company will acquire, and which comprise substantially all the principal producing mines in the South-West Protectorate, are: Pomona Diamanten Gesellschaft; Koloniale Bergbau Gesellschaft m.b.H; Deutsche Diamanten Gesellschaft m.b.H; including its interest in the Halbscheid Gesellschaft, Diamanten Pacht Gesellschaft; Diamanten Aktien Gesellschaft (Vormals Weiss De Meillon and Company); Neue Hanse Diamanten Gesellschaft m.b.H; Vereinigte Diamant Minen Gesellschaft; Consolidierte Luderitzbuchter Diamant Minen Gesellschaft m.b.H; Grubenbahn Gesellschaft Pomona m.b.H; Gesellschaft fur Kolonial Werts m.b.H; and Deutsche Kolonial Gesellschaft fur Sud West Afrika.

4. The main provisions of the Agreements with the Vendor Companies are :—

(a) That the purchase consideration payable to them is the sum of £3,675,000, payable as to £1,900,000 in cash, and as to the balance of £1,775,000 by the issue of an equivalent number of fully-paid £1 shares of the Consolidated Diamond Company.

(b) That the sale shall take effect as from the 1st October, 1919, and that pending the incorporation of the Consolidated Diamond Company, the Vendor Companies will carry on mining operations in the usual manner for account of the new Company.

(c) That a debenture issue of £1,850,000 bearing interest at 8 per cent. per annum, payable half yearly, and redeemable in the year 1929, shall be created, providing for a sinking fund for the redemption of the debentures, into which there will be paid annually an amount equal to 7½ per cent of the debentures for the time being outstanding.

(d) The Trustees for the debenture-holders have the right to vote in respect of the debentures outstanding on the basis of one vote for each £1 nominal value of debentures, and the debenture-holders possess the privilege for ten years of converting their debentures into fully-paid shares of the Company at the rate of one share for every £1 value of debentures surrendered.

5. An Agreement has also been concluded with the Luderitzbuchter Elektrizitats Gesellschaft m.b.H for the sale of this company's property and assets to a new company to be called the South-West Electric Power Company, for a consideration of £300,000. The selling company possesses a fully-equipped plant at Luderitzbucht, which supplies electric power and light to the mining companies and also to the township of Luderitzbucht. The new company will discharge the purchase price of £300,000 by a debenture issue of a like amount, bearing interest at 7½ per cent. per annum. These debentures are guaranteed, both as regards capital and interest, by the Consolidated Diamond Company, which will hold practically all the shares in the new power Company.

6. The Board of the Consolidated Diamond Company consists of nine Directors, of whom five have been appointed by the Anglo-American Corporation and their associates, and four by the Vendor Companies.

7. In 1914, the German Government decided to limit the sales from the diamond fields of South-West Africa (now South-West Protectorate), and allocated a fixed quota in carats of diamonds which each producer could contribute for sale. Upon the basis of the quotas then allocated, the fields now acquired by the Consolidated Diamond Company have a producing capacity of more than 90 per cent. of the entire output of the South-West Protectorate. It is a fact, however, that this output can be considerably increased, and that if such increase were made it would effect, not only very large economies in working costs, but would materially increase the Government's share of revenue, and also the Company's share of profits. At a recent conference of producers convened by the Government, and held shortly before the Consolidated Diamond Company was established, it was arranged to allocate to the producers of the South-

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West Protectorate a quota equal to 21 per cent. in value of the annual sales. It is anticipated, however, that an adjustment of the quotas will result, on representation to the Government, and to the other interested parties, as it is only fair that the Consolidated Diamond Company, as the chief producer in the South-West Protectorate, should be treated on the same terms of equality as are accorded to the three chief producers in the Union. In the latter case, a definite quota is allotted to each, with the right to the others to make good any shortfall in case any producer should be unable to produce its quota; and, further, the small producers in the Union are not affected by the quota, but are at liberty to produce without restriction. The Board of the new company claim that the same principles should apply to their company also; namely, that this company should participate in the right to make good any shortfall in case any producer should be unable to produce its quota, and that the small producers be at liberty to produce without restriction, like the small producers in the Union. In this connection, however, it should be observed that the Board of the Consolidated Diamond Company fully agree with the policy which actuated all the members of the conference, viz., that the regulation and control of output, as well as of the sale of diamonds, are vitally essential in the interests, not only of the State, which derives such substantial revenues from diamond mining, but also in the interests of the producers and of other persons engaged in the diamond trade and industry.

8. It has already been stated above that the various fields acquired by the Consolidated Diamond Company embrace substantially all the principal producing areas in the South-West Protectorate, but the following further information in this connection may usefully be recorded :—

(a) Shortly before the war, Professor Kaiser, of Giessen University, a geologist of wide repute, was despatched to investigate the extent and causes of the diamondiferous deposits in the Protectorate. Owing to the outbreak of war shortly after the arrival of Professor Kaiser, he was compelled to remain in the Protectorate throughout the period of the war, and consequently, instead of his investigations being limited to a few months, they were extended practically over the whole period of the war. In a report made by the Professor, he states that (translation): "If one examines the results of the actual exploitation of the fields and the prospecting work carried on so far, then, in the light of these experiences, one arrives at the result that the contents of the fields is for certain 14 million carats, and that it will probably amount to 16½ million carats, and this does not exhaust all the possibilities of the fields. Large sections of the diamond area are only now being prospected. For instance, the result of prospecting during the last few years of the war proved that several companies possessed valuable diamond deposits not known until then, which have now been included in the estimate made. By following up the information gained, etc., no doubt new deposits will be proved, and may finally lead to the discovery of a diamondiferous kimberlite fissure, or even of a diamond pipe. This will show that great possibilities for the opening up of further diamond-bearing deposits exist. It follows from the above that it is quite possible that several million—possibly even many millions—of carats may be recovered from the diamond area in excess of the above estimate. I must still add that, in consequence of the amalgamation into one big company, many deposits which a small company could not exploit economically may now prove profitable."

(b) The increase in the prices now obtained for diamonds is also a very important consideration. The latest basis price as fixed by the Diamond Selling Syndicate under the new contract exceeds £5 per carat for South-West production.

The Mine Accident Rate in 1919.

The accident mortality of the mines of the Rand for 1919 proves to have been reduced to 2½ per mille, which is a record, contrasting with four and even five per mille previous to 1911. The latest achievement is a triumph for the "Saftey First" campaign of recent years, and for the departmental insistence on careful mining. An outstanding feature is that of the City Deep which was the fifth worst in 1918, and consequently incurred the strictures of the Department, has, in the past year, reduced its rate from over four to below one-half per mille, thus winning the Rand Mutual Insurance Association's prize with flying colours. The Crown, New Modder and Rose Deep mines' statistics are conspicuously good, and those of the East Rand Proprietary and Government Areas up to the average. The Randfontein Central's showing is, however, bad, this being explained by rolling stones in the steep stopes and considerable shaft sinking.

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SHORTER HOURS AND UNDERGROUND TRANSPORT.

Preparing for Underground Electric Locomotives on the Far East Rand—What the Geduld Company is Doing.

THE marked changes in industrial conditions which have taken place on the Witwatersrand during the past year or two have naturally made for modifications of policy in regard to underground work. The value of long accumulated ore reserves has, for instance, to be reconsidered in the light of the gold premium and of the higher wages paid to underground workers. But no other factor has given cause for so much careful consideration and action as the decreased working hours.

DEEP MINES AND LARGE MINES.

In his evidence given before the Low Grade Mines Commission a few months ago, Mr. James Whitehouse, manager of the Village Deep, which is the deepest mine on the Witwatersrand, gave some important facts and figures which clearly showed the effect on working costs of having to lower and hoist men and tools four thousand feet or more. By the time workers have reached their faces the amount of actual working time remaining in a 48-hour bank to bank week is nothing very great, especially so when it is remembered that under the Mining Regulations it is the duty of the white miner to precede his coloured gang and inspect the working places before the shift is commenced. It is obvious that the deeper the mine the greater is the reduction in the hours of work. This has been long realised, but it is not generally appreciated that the reduction of actual working time has a very important bearing on large claim areas such as those of the Far East Rand, as well as on the deeper concerns with smaller properties on the Central section of the gold fields.

SOLVING THE PROBLEM ON THE FAR EAST RAND.

On the Far East Rand mines, drives extend over tremendous distances and working places are sometimes as much as two miles or more from the nearest haulage shaft. It is clear that under these circumtances a big mine is penalised more severely in regard to working time than a deep mine, for it is obviously a lengthier business for a shift to walk along a mile or two of drives and back to the shaft station than it is to lower and hoist a shift in a deep shaft with modern high speed winding plant. In other words the influence of shorter hours reflects in a lateral sense more adversely on the operations of the Far East Rand mines than it does in a vertical sense on the Central Rand areas. The solution, or at any rate partial solution, of the problem appears to lie in the direction of installing rapid underground transport. In this respect it is interesting to learn that at the Geduld Proprietary Mines, where ore, and therefore men and tools have sometimes to travel as much as two and a half miles under ground, a start has been made in connection with the establishment of an electric loco service on a large scale.

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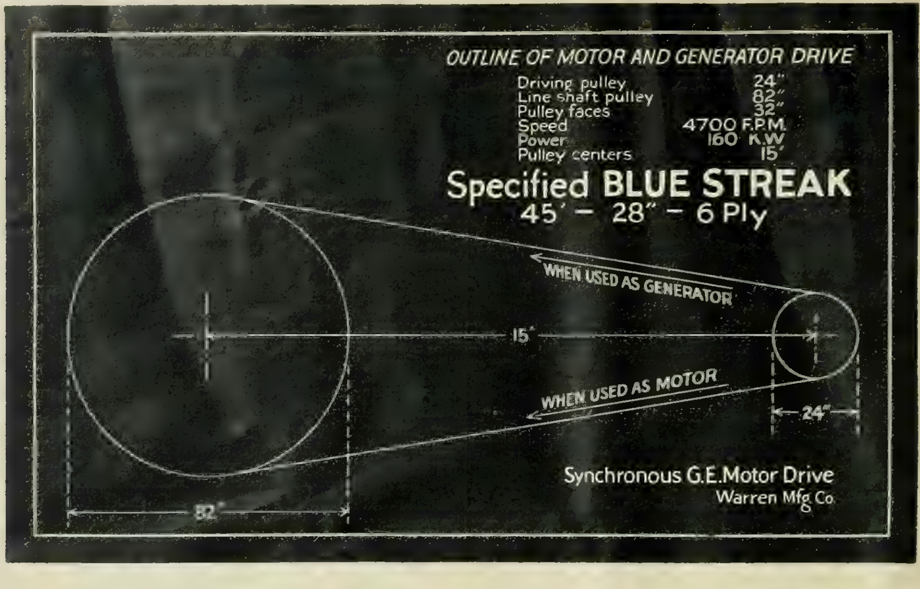

Making One Belt–and the G.T.M.–Do the Work of Three

Three belts had been devoured in twelve months by a certain motor drive in the Warren Manufacturing Company's Warren plant. All were large belts. Some were expensive belts. Together the three loaded that drive with a pretty figure of operating costs. While the third belt was petering out, a G. T. M.—Goodyear Technical Man—called. It was our Mr. Ford.

They looked at his card, asked him in, listened a while and asked the price of a belt for that motor drive. The G. T. M. didn't even take time to ask the width of the belt—he just said that he didn't know the price. Before they could ask him what kind of salesman he was, he told them about the Goodyear plan of selling belts—of thoroughly studying conditions and then prescribing the belt that would meet those conditions most efficiently and economically. They thought of three belts of the past twelve months and reasoned that they had nothing to lose by trying the plan.

He studied that drive. It was a hard one. The speed was close to a mile a minute—and when the motor was not used as an auxiliary for driving seven beaters, it was reversed and used as a generator. The centres were short. There were a number of other peculiar conditions—but after the G. T. M. got through studying them he knew just what to do—he had seen some drives very like it and had tried out his prescription.

After allowing for special circumstances he prescribed a belt of only six plies—although many a power engineer would have said that more were necessary. But he knew the proved strength of every Blue Streak ply—a brute strength as remarkable as its pulley hugging grip. So he prescribed a twenty-eight inch six-ply Blue Streak transmission belt.

That belt was applied in November, 1916. Its cost was less than that of one of the three belts that had been so disappointing, and yet that Blue Streak lasted longer than the three together. That synchronous drive doesn't pile up any more undue costs for the seven beaters it serves, doesn't cause interruptions nor lowered efficiency any more.

If you have a belt-devouring drive that is eating too many pounds, ask a G. M. T. to call. He'll do it without charge when he is in your vicinity. There are many of them—all trained in the Goodyear Technical School—all with experience in plants similar to yours—all selling belts to meet conditions and not as a hardware store sells nails. The G. T. M.'s services are free simply because the savings they effect for purchasers are so considerable that a gratifying volume of business from the plants served is certain to come to us within a few years.

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THE POWER PROBLEM: THE VALUE OF PLANT ANALYSIS.

The proper study of power necessarily includes belts. No matter how competent the generative source of power, the final results from a drive depend on the success of the transmission. A belt may even be in many respects a good belt and yet fail to deliver the power load economically because ill-adapted to the work. A solution of the problem is the right belt for the particular need. On account of the many different qualities of mechanical rubber goods, the Goodyear Tyre and Rubber Company long ago realised that in order for mechanical goods purchasers to get out of their equipment the service which is built into it, it was necessary that the manufacturers have a definite knowledge of just what service their material will give under certain conditions, and then have a knowledge of the operating conditions where their material is to be used: so in order to do this, they originated and put into effect a plant analysis plan of marketing goods, which necessitated every Goodyear man being given a special schooling and training on the constructions of mechanical rubber goods and their practical application.

Plant Analysis.

The Goodyear plant analysis consists of having a G.T.M. (Goodyear technical man) study carefully the conditions surrounding every drive, every conveying system, every hose line, and every valve and packing position. This study does not consist merely in taking the exact measurements necessary to specify the proper material—although, very often that is the only information that can be recorded on the plant analysis blanks. It consists mainly of examining every detail that has a bearing on the life or service of the goods to be used.

Study of the Power Problem.

This then is the idea underlying the service of the G.T.M. The basis of his recommendation for a single drive or an entire plant is careful study of the power problem involved. To this analysis he brings the force of experience, the example of hundreds of comparative studies, the judgment of a man grown expert in the operating and observing of many drives under many conditions. His plan is the scientific one. His one thought is, in every instance, to apply the article that will give the best service possible. So instead of following the old way of marketing goods just to meet a price, the Goodyear people employ practical methods of selling service based on scientific principles of analysis to apply the right article for the particular need.

A Proved Success.

This plan of marketing goods is not an experiment. Wherever Goodyear has direct factory representation this policy is in effect, and it has been proved and is acknowledged by the large engineers, operators and buyers throughout the world as being the most practical, scientific and economical.

The Organisation.

This company is not an agency but is now direct factory representation. The men who direct its policies and are responsible for their results (since September last) are here direct from the giant Goodyear factories where each of these men has been thoroughly trained in the Goodyear Technical School and are experts in the departments they represent. Every man in this organisation is building for the future and striving to protect the name of Goodyear, which, throughout the world, stands for quality, honesty and clean up-to-date business methods. These are important things to remember when in the market for mechanical rubber goods.

One expects from the Goodyear products the highest values possible, and when applied according to the firm's recommendations they must give the expected service: they last much longer than the average product of other makes—their first cost is but little more—their final cost is considerably less.

Ask the G.T.M. to analyse your plant—his services are free, it will not obligate you in any way—then test his work by using the Goodyear product prescribed for your worst condition. The results you get will be the firm's compensation, for these results will bring other orders from you based on the recommendations of the G.T.M.'s plant analysis. Large stocks are carried at Johannesburg and Capetown, also at the firm's mechanical goods service stations at Durban and elsewhere throughout the Union.

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DORMANT COMPANIES AND "DUG OUT" DIRECTORS.

Concerns that have Disappeared—Ancient "Guinea Pigs"—The Need for Youth and New Ideas.

SCARCELY a week elapses but this paper receives two or three inquiries regarding defunct and moribund companies and syndicates. In many instances we have been able to give correspondents information regarding the concerns in which they are or have been interested, but there are numerous ventures regarding which no reliable information is obtainable. The directors are all dead or have flitted to another sphere, nothing is known of the secretary, and the only fair presumption is that the assets (if any remained) have long since passed into the hands of the liquidator.

THE SOMNOLENT SYNDICATES.

There is, however, another class of concern regarding which we also receive many inquiries and of which it is more easy to obtain particulars, although the information is seldom satisfactory to shareholders. This is the dormant type of company which possesses assets, land, claims, buildings, and money in the bank, but which has never yet paid a dividend and probably never will. In some instances these concerns have actually cash resources exceeding the market valuation according to the share quotation, and it would be most decidedly in the interest of shareholders to liquidate the concerns and distribute the assets. A few months ago we published, in response to several requests, particulars of one or two companies so circumstanced, and we intend in the near future to give a list of moribund and dormant concerns for which particulars are available. In regard to the companies shareholders in which would benefit from liquidation, it would seem that the directors prefer to draw their fees rather than see the company or syndicate's assets realised and the funds invested in "live" enterprises. Directors of this kind are a hindrance not only to the company concerned but to the community at large. Directors of this type are generally of the "wait and see" variety and are influenced by greed and old age.

THE DUG-OUTS.

During the War one heard a lot about "dug-outs." The term is one of the many wonderful phrases bequeathed to disgruntled civilisation by the great conflict, and it has two applications. A dug-out may mean a deep and more or less comfortable funkhole, or it may imply some person ripe in *Anno Domini* and full of gout who has been dug out of the quiet garden of life's evening and pitchforked into some job where his years save him from a court-martial. Many of these antique specimens of manhood were to be observed in most of the theatres of war, and the reason why we allude to the type here is that there are not a few of them to be observed in the local theatre of industry. Month after month and year after year these venerable old gentlemen take their seats around the table in the board rooms of numerous South African companies. There they sit in solemn conference and when the chairman moves the adoption of a report, no matter whether it be a good report or a bad report, they have much pleasure in seconding it. They also show their keen interest in the affairs of the company which they direct by proposing a vote of thanks to the chair, or the payment of a fee of so many guineas to the auditors, or perhaps a distribution of a bonus amongst the members of the board.

A PLEA FOR YOUNG BLOOD.

They move that their colleague, Mr. Octogenarian, who retires under the articles of association but is eligible for re-election, be re-appointed a director, and now and then they display their business acumen and shrewdness by signing a cheque. In our own experience we have known of three or four of these honourable and revered old gentlemen who have sat on the boards of Rand gold mining companies for the last 18 years. No one questions their integrity or quarrels with the dignity of their pose. But we have never known these dear old things to say or do one single thing which would be above the capacity of an office boy. Yet they have drawn many thousands of pounds from the companies with which they are associated, and we submit that it is high time these patriarchs saw fit to retire and make way for younger men of ideas and action.

Koffyfontein Mines Annual Meeting.

The annual meeting of shareholders of Koffyfontein Mines, Ltd., was held at the head office of the company at Kimberley last week, Mr. F. Hirschhorn presiding. In moving the adoption of the directors' report and balance sheet for the year ended June 30, 1919, the Chairman referred to the great loss sustained by South Africa through the death of General Botha. He also referred feelingly to the death of the company's secretary in London, Mr. W. M. Gower. Dealing with the figures for the 12 months, he said the working for the year, after providing for depreciation, resulted in a profit of £42,754 12s. 2d. being carried to appropriation account, which, with the balance of £24,633 7s. 11d., gave a total of £67,388 0s. 1d. After allowing for last year's dividend and providing for Union Government taxation, an unappropriated balance of £30,689 14s. 2d. remained, out of which it was proposed to pay a dividend of 7½ per cent., less Union dividend tax. He mentioned that hauling operations were resumed in April last, and had since been carried on continuously, and that the company had recently started night hauling.

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THE WEEK IN THE SHAREMARKET.

Native Strike Peters Out—A Quiet Week—London Dull—Diamonds, Tins and Silvers Active.

The local market in so far as gold stocks are concerned has been singularly uneventful during the past week. Native unrest along the reef, culminating in the serious affray at the Village Deep, has tended to make operators rather nervous. It now looks as if the trouble with the mine boys is over, but London has gone weaker on fears of a rise in the bank rate, and although London is not nearly such a big buyer of Kaffirs since the restrictions on credits were imposed, local quotations have reflected the duller tone from overseas. The month now drawing to a close contains only 24 clear working days, and this, coupled with the disorganisation resulting from native strikes, is likely to cause considerable contraction of gross output and profit. Gold, however, commands a premium of over £6 per oz. (the price, after declining to 121s., has improved to 122s. 6d.), and the earnings of most companies should be at least large enough to maintain the dividend rates announced at the end of the year. Amongst Far East Rand developing concerns Modder Easts have been substantially better with sales up to 28s. and slightly over, and the options have correspondingly improved. When the gold market is dull the local public invariably find some other sphere for operation of prices, and during the past few days diamond stocks have been decidedly "lively." The tremendous prices now obtaining overseas for diamonds have assisted in the creation of a gem market and this has been furthered by the advent of the new Postmas shares (which have a nominal value of 2s. 6d. and have been dealt in up to 13s.), the resuscitation of the Greig Diamond Syndicate, and the restarting of Frank Smiths. The five-shilling shares of the Greig Diamond Syndicate, which has a large alluvial area near Schweizer Reneke, have risen to the high premium of 40s. Crowns have improved to 15s. on reports of a good washing result for February. Rouxvilles are steady at 24s. 6d., and Roberts Victors, Stienies and Victory Diamonds have all come in for attention. Tin stocks, despite the rise in the price of metal to £410 per ton, are quiet, but an early movement in this class of stock is predicted. Rooibergs have been bought fairly extensively around 10s. 6d. and 11s. Transvaal Silver and Base Metals have risen both in respect of shares and options, and a further advance is anticipated. Oils are in the doldrums, still awaiting news from oversea in regard to the much-discussed option granted to an important English firm.

	Fri. 20th.	Sat. 21st.	Mon. 23rd.	Tues. 24th.	Wed. 25th.	Thurs. 26th.
Anglo-Amer. Corp.	50 0*	51 9*	52 0*	52 6	52 6	51 6
Apex Mines	6 6*	6 6*	6 6*	6 6*	6 7*	6 0*
Aurora Wests	—	—	—	6 0*	—	6 3
Bantjes Cons.	4 8*	4 6*	4 6*	4 4	4 0*	4 1*
Brakpan Mines	76 0	71 6	72 0*		71 0½	71 0*
British S.A.	—	24 0*	-	-		
Bushveld Tins	1 11	1 11*	1 10*	1 11	—	1 11*
Cassel Coals	30 0*	30 0*	—	-		-
Cinderella Cons.	7 0*	—	7 0†	6 6*	6 6*	6 6*
City and Subs.	7 3	7 3	7 3*	7 3*	7 3*	7 3*
City Deeps	66 0†	65 0†	65 6	65 6*	—	67 0†
Clydesdale Colls.	24 0*	—	—	—	—	—
Con. Investments	34 0*	—	-	—	—	—
Con. Main Aeefs	15 10½	15 3	16 0	16 0	16 6	16 6
Con. Mines Selections	31 0*	31 0*	31 0*	31 0*	31 0*	31 0*
Coronation Freeholds.	2 4	2 2*	2 2*	2 2*	2 3*	2 3*
Coronation Synds.	18 0†	17 0	17 0*	—	16 6*	15 0*
Crown Diamonds	12 3*	12 3*	12 6	12 6	13 9	15 2
Crown Mines	80 0a	78 6*	78 *	77 6*	80 0	78 0*
Crown Mines Debs.	—	—		£96*	£97*	—
Daggafontein Mines	18 3*	18 0	18 0*	18 3*	18 6	19 0
Do. Options	4 0*	3 0*	4 0*	4 6*	4 3*	4 6*
East Rand Coals	2 4*	2 4*	2 3*	2 3*		2 6†
East Rand Deeps	1 2*	1 1*	1 3*	1 2*	1 3†	1 2*
E.R. Minings	22 6†	—		—	—	—
East Rand Props.	13 3	13 6	14 9	14 6	14 3	14 3

*Buyers. †Sellers. AEx London. BOdd lots.

	Fri. 20th	Sat. 21st.	Mon. 23rd.	Tues. 24th.	Wed. 25th.	Thurs. 26th.
East Rand Debs.	£68*		—	£68*	£68*	£68*
Eastern Golds	1 3*	1 3*	1 3*	1 4*	1 4*	1 6*
Ferreira Deeps	—	—	—	12 0†	—	—
Frank Smith Dmds.	7 11	8 0	8 0	8 0	8 6	9 6
Geduld Props.	55 9	55 6	55 0*	56 0†	55 6	55 9
Glynn's Lydenburgs	17 6	—	—	16 0*	16 0*	—
Govt. Areas	97 0	97 0	96 6*	96 6*	98 0	97 6
Jhb. Bd. of Ex.	35 0*	35 0*	35 0*		35 0*	35 0*
Jupiters	5 9*	6 0	6 0*	6 0*	6 3	6 0*
Klerksdorp Props.	2 1*	2 1*	2 1*	2 0*	2 1*	2 0*
Knight Centrals	6 10*	6 9*	6 9*	6 9*	6 11*	6 10*
Knights Deeps	9 0*	—	—		—	—
Lace Props.	14 0*		—	—	16 0*	15 0*
Leeuwport Tins	29 3*	29 6	29 6	29 6	30 0	30 0
Luipaardsvlei Est.	6 0†		6 0†	-	—	—
Lydenburg Farms	8 0†	8 0†	8 0†	—	7 6	7 6*
Meyer and Charltons.	—	-	—	—	100 0*	
Middelvlei Est.	2 3	2 2†	—		—	2 2†
Modder B.'s	153 0*	150 0*	151 0	147 0*	149 0a	150 0a
Modder Deeps	53 3	54 9	55 0	54 9	54 0	54 9
Modder Easts	26 6	26 9	27 6	27 9	28 0	27 10½
Do. Opts. (3 yrs.)	6 4*	6 6*	7 0*	7 3	7 5	7 4
Do. Opts. (4 yrs.)	10 3	10 6	10 6*	11 6	11 9	11 10½
Do. Debentures	£131½	£133	£134*	£136	£138	£137
Hume Pipes	21 0	21 9*	22 0	21 6*	22 6*	22 6
New Boksburgs	2 0*	2 9*	2 0*	2 0*	—	2 2*
New Eland Diamonds	72 6	70 0*	—	72 6*	72 6*	—
New Era Cons.	10 9*	10 9	10 6*	10 6	10 6*	10 6
New Geduld Deeps	2 3*	2 3*	—	2 3*	2 3*	
New Heriots	—	10 6†	—	10 6†	—	—
New Kleinfonteins	13 6	13 4½	13 9	13 7*	14 6*	14 3
New Modders.	83 6	83 6	83 6*	83 6	83 3	83 6
New Unifieds	-		—		—	9 6*
Nigels	9 6	9 6	9 6*	9 6*	9 6*	
Nourse Mines	—	—		15 6*	—	14 0*
National Banks	295 0†	-	295 0	295 0	295 0†	295 0†
New States	29 9*	30 0†	—	31 0	31 0a	31 0
Premier Deferreds	—	160 0†	—	160 0†	—	
Premier Preferreds		—	—	160 0†	160 0†	152 6*
Pretoria Cements	85 0	95 6*	97 0	96 0*	96 6	97 0*
Princess Estates	2 9	2 3*	—	2 3*	1 0*	2 6*
Rand Collieries	—	3 0*	—	-		-
Rand Nucleus		2 3†	2 3	2 1	—	2 0*
Rand Select. Corp.	102 6*	104 0	104 0*	103 6*	103 0*	104 0*
Randfontein Deeps.	6 6*	6 6	6 6*	6 9	6 6*	6 6*
Randfontein Estates	27 0†	26 3	26 0	25 6*	25 9*	26 0*
Roberts Victors	18 0*	19 6†	17 0*	17 0*	18 0	18 0*
Rooibergs	8 6*	8 5	8 0a	10 0	10 5	10 7½
Roodepoort Uniteds		6 0†	7 6*			6 0†
Ryan Nigels	—	—	—	—	3 3	3 6*
Rouxville	23 6*	24 0	23 9*	23 9*	24 0a	24 6*
Shebas	2 6*	2 6*	2 6*	1 9	2 6	2 6
Simmer Deeps	3 6*	3 6*	3 6*	3 9†	3 6*	3 6*
S.A. Lands	6 6½	6 6*	6 6*	6 3*	6 6	6 4*
Springs Mines	57 0*	57 3	58 0	57 0*	57 3*	57 6
Sub Nigels	17 3*	17 6*	18 0	18 0	17 6*	17 6*
Swaziland Tins	14 0*	14 0*	14 0*		—	14 0
South Van Ryns	9 6	[illegible] 0	8 9	8 9*	8 9	8 9*
S.A. Alkali	25 0	24 6	24 0†	24 0	22 6*	21 0a
Transvaal G.M. Est.	18 0†	16 6*	16 6*	—	16 6*	16 6*
Transvaal Silver	—	—	—	—	—	44 0*
Do. Options.	-			—		23 0*
Union Corp.	25 0*	25 0*	—	—	—	—
Union 5 per cent.	£102½	£101*	£102	£101½*	£102½	£102½
Do. Tax	£97*	£97¾†	£96½	£97†	£97	£97*
Van Ryn Deeps	—	99 6	100 6*	100 0	101 0	100 0*
Village Deeps		16 3	16 0*		—	15 3*
Victory Monarch	59 0	59 0*	59 0*	59 0*	60 0*	60 0*
Van Dyks	3 9	3 9†	3 9†	—	3 3*	3 9
Village Main Reefs	—	—	—	—	10 0†	—
Welgedachts	—		—	—	—	30 0†
West Rand Cons.	8 0†	8 0†	8 0†	7 6*	7 6	8 0†
Western Rand Est	8 6*	7 5*	7 6*	—	7 3*	7 3*
Witbank Collieries	—	—	—	—		70 0*
Witwatersrands	22 0†	21 0†	21 0†	22 0†	22 0†	22 0†
Wit Deeps	12 9	12 9*	13 6	13 0*	13 6†	13 0†
Wolhuters	6 0	5 9*	—	6 6*	6 1*	6 1*
West Springs	22 0	21 9	21 0*	22 0*	22 6*	22 6
Do. Options	6 3	6 6		6 6*	6 6	6 6*
Tweefontein Colls.	25 0†				25 0†	25 0†
Zaaiplaats Tins	11 1½	10 9	10 9*	11 9	12 3	12 3

*Buyers. †Sellers. AOdd lots. BEx London.

STATE AID FOR THE MINING INDUSTRY.

A Practical Suggestion to Assist Private Enterprise by Technical Advice.

A VALUABLE suggestion was made by Professor Cellier, of the School of Mines, at a recent meeting of the Chemical, Metallurgical and Mining Society in the course of the discussion on Mr. T. G. Trevor's paper. *Inter alia*, Prof. Cellier said:

A consideration of the figures shows that during a period of 10 years the following amounts have been spent on properties ultimately abandoned :—

141	Exploration prospecting, at £500 each	£70,500
122	Development, at £2,500 each	£305,000
131	Producing, at £10,000 each	£1,310,000
394		£1,685,500

The total is still further increased when 419 ventures eventually proved a failure and 17 are still doubtful.

This amount of money is virtually lost to the country, excepting for that proportion which is paid for local products and indirect taxation.

The failing of some 90-94 per cent. of ventures has a very depressing effect on future expansion, and would tend to decrease future production.

Such failure will, no doubt, never be entirely eliminated, for "nothing venture nothing win." A large proportion of the capital thus lost could, however, be directed to better purpose if the investors were well advised.

In this country technical advice is obtained only from privately practising men, and from the consulting engineers of the groups, who may not always be unbiassed. Added to this is the fact that the expense entailed for such advice may also be considerable.

In the Director and Assistant-Director of the Geological Survey, the country has most capable men, but the enormous area still to be mapped and the smallness of the staff obviates use being made of them to the extent necessary.

The Inspectors of Mines in outlying areas are of assistance, but their time, also, is largely taken up by attending to the enforcement of regulations tending more to safety on producing properties than to the development of future producers.

What would be of enormous assistance to the investors in such properties as have failed, is the appointment, at State expense, of an inspecting engineer to the Mines Department; the conditions suggested of such appointment to be, say :—

1. Salary and transport expenses not to exceed £1,500 and £500 per annum.

2. South African by birth, if possible, and certainly by experience.

3. Experience of both underground and surface equipment, and of South African geology, and particularly mineral occurrences.

4. Duties to be devoted entirely to properties in a non-profit-making condition, or to those willing to pay fees when possible.

Free technical advice is available in this country to farmers, through the Veterinary Department, to many poor people through the hospitals, and it also should be available to an industry which in ten years produces in direct taxation alone an income of £791,352 in but one of the Mining Inspectorates of the Union.

The cost would be £20,000, or about 2.5 per cent. of the income, or 1.25 per cent. of the amount spent on abandoned properties.

The correct working of the successful properties, owing to competent technical advice, alone might increase the income so as to more than pay for the expenditure, but the saving effected by such advice at the early stages of properties abandoned later would, no doubt, result in a loss in claim licenses.

The idea is not that the State should find the mine and work it for nothing for the owner, as sometimes seems to be desired in farming operations, to find scab and kill it for the owner, or to store water and irrigate for the owner.

Suggestion of such a post is not a method of applying for it by the speaker, and its limitation to South Africans is not due to any political tendency, but simply because experience of local conditions takes some time to acquire, and the sooner it is obtained the better.

The remarks on the Department of Geological Survey and Inspectors of Mines are not a reflection on these, but, as pointed out, a whole-time man with good mining experience and true mining duties is desirable.

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EXAMINATION RESULTS.

MANAGERS' EXAMINATION held January, 1920.—We obtained no less than **NINE** passes from **ELEVEN** Entries.
This constitutes a percentage record for this Examination.

SURVEY EXAMINATION held November, 1919.—SIX of a total of **SEVEN** Passes were obtained by our Students. All other coached men failed to pass.

OVERSEERS' EXAMINATION.—We are **AHEAD** of all coaches with passes 1918 and 1919.

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ENGINEERING SECTION.

THE "DANIAL WAKALL" IMPROVED WATER BLAST.

Designed by J. Danial (Government Mining Areas).

The device has for its object the improved means for the allaying of dust and deleterious gases in mine air, by utilising water under pressure, causing it to split into fine particles by striking solid surfaces, and subsequently atomised by compressed air. The device consists of an outer shell or casing, fitted internally with a plug valve, with two passages, one for the airway, and the other for the water. In the air passage a non-return ball valve is placed. The airway connects with a cylindrical sleeve, admitting the compressed air to an inner chamber through slots at the back end. Within this chamber is fixed an air regulating spindle with cone shaped face, forming a valve with the inner front head cone surface of the sleeve, acting as a valve seat. The extension of the spindle beyond the valve face is a distributing cone (1). The water passage connects with an annular chamber surrounding the front head of the sleeve, which has a cone face forming a valve with the outer casing as a valve seat. The screwed spindle is rotated within the sleeve, and the screwed sleeve carrying the spindle rotates with the casing. The plug valve is operated by a removable key. The functions of the device are as follows:—Compressed air and water under pressure are connected to the device by the usual pipe fittings. The key operating the plug valve is rotated through a quarter of a turn, admitting the air and water into their respective chambers. The screwed sleeve is rotated back to form the required aperture between the casing and the sleeve to determine the quantity of water used. The spindle is similarly adjusted within the sleeve, controlling the quantity of air used. The water under pressure issues from the chamber in a cone shaped jet, and striking the spindle, is split into fine particles. The compressed air issuing from the centre behind the water immediately projects the fine particles of water on to the head of the spindle, which deflects the atomised water into a cone shaped stream, the degree of atomisation being controlled by the adjustable apertures of both the air and water. The non-return valve placed in the air passage of the plug is to prevent the back pressure of water entering the compressed air mains when the air pressure fails, or, for economic saving, is cut off after the blast has been in operation for a certain length of time. The removable key operating the plug valve can only be separated from the casing when the blast is turned full on. As the device is placed in direct connection with the air and water services, without any intermediate valves between the mains and the devices, the return of the key to an official is a direct proof that the water blast has been put into operation. The claims for the device are as follows: (1) The adjustable sleeve regulating the quantity of water used. (2) The adaptability for clearing the water aperture in the event of its being choked, by rotating the screwed sleeve in the casing and flushing the aperture clear. (3) The regulating spindle allowing any quantity of compressed air to pass. (4) Any desired combination of quantities of air and water producing every degree of atomisation from a dry fog to the state in which the particles of water rapidly fall out of suspension. (5) The retaining valve in the air passage of the plug automatically closes when the air falls to atmospheric pressure, thereby ensuring the inability of any back water pressure entering the air mains. (6) The inability to remove the key except when the water blast is in operation. Messrs. Bartle & Co., Ltd., are the selling agents for this device.

THE "KELCO" SHOVEL POINT.

Amongst recent inventions on the Rand is the "Kelco" shovel point, which made its first public appearance at the mining exhibition, held at the School of Mines in January. At once the most essential and vulnerable part of a shovel is its point which, when new, is pronounced. Very soon the point disappears and the end of the shovel becomes first rounded, then flat, and finally worn in at the centre. When the shovel has reached this stage its efficiency has depreciated 50 per cent. It is then very difficult to get it to penetrate broken rock. The "Kelco" point may be fitted to any shovel and preserves its point over a width of three and a half inches. On a central mine extensive tests have been carried out. A number of shovels, some with and others without points, were put in the mine, and placed under similar conditions. Long before the "Kelco" points had worn down, the unprotected shovels were worn out. When finally the "Kelco" points were worn out, by which time two ordinary shovels would have been discarded, it was found that the shovel itself had been so effectively protected that it could be fitted with a second point, and was then a better tool than the ordinary new shovel. One shovel, thus twice pointed, will outlast four unpointed shovels. And, with shovels costing 5s. 6d. each, the cost would be 9s. 6d. as against 22s. The advantages claimed for the "Kelco" point are: More than doubles the life of the shovel; preserves all the time a leading point, thus enabling the shovel to penetrate easily into accumulations of broken rock; breaks up caked rubble by a stabbing action and, in this instance, combines the offices of pick and shovel. This device should be found of great value to all workers of rock and rubble, whether on the mines or on the land, and should be invaluable to the diamond diggers. The patentees are Messrs. Kelly & Co., mining material merchants and contractors, 42 Winchester House, 'phone 4333, from whom further information may be obtained.

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TRADE AND INDUSTRIES SECTION.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Native Strikes Affecting Business—The Trend of Things—Iron, Steel and Machinery—Paint, Painters and Brushware—Timber and Building Materials—Dynamite: Increased Price of Nitrate of Lead and Lead Pipe—Electrical Goods—The Cost of Living—The American Trade.

BUSINESS has been very quiet, chiefly owing to the native miners' strikes, creating a nervous tension throughout the Reef and so preventing the mines buying; and also it is within a few days of the end of the month. When it became known that the Chamber of Mines, apparently with the cognisance of the Government, had decided to repatriate the natives to their kraals, a quieter feeling became evident, especially when batches resumed work on the various mines on the East Rand. The recent drought served us in good stead, as foodstuffs are very scarce at the native kraals, therefore the repatriation scheme seemed to put a damper on the leading strikers' enthusiasm. The Chamber of Mines are very fair in their dealings with all the workers, and were perfectly within their legitimate rights in proposing to send the natives home when they refused to complete their contracts. A disquieting feature is that the natives are good copyists, and are simply following out the invitation of the white men in downing tools, much to the unsettling of everybody and everything. The strike is the thing to be guarded against in such a mixed population, particularly as one man receives so much and has practically got what he asks for, whereas the others have also seriously felt the high cost of living.

THE TREND OF THINGS.

Inquiries have been made as to the inconvenience caused by the banks adopting an increased charge for oversea drafts. One commercial broker, who moves very freely about, says that he has not heard of one case where any merchant doing a sound, legitimate trade has complained against the bank managers. However, when a conversation springs up it is recognised that these are not the times to ask much from the banks, simply because the exchanges throughout the world are upset, owing to most countries being so overburdened with debt and their paper money issues. Some relief is expected after July 10, 1920, when the war profit tax comes to an end, being six months after the official peace has been declared. In the meantime, a scare was caused by the Premier's statement as to profiteering in maize and white corn, followed up by calling for certain returns to show exactly where the hoarding is taking place. And further, the daily papers give much prominence to the true bargains in maize, where hundreds, and even thousands, of pounds were lost and won, without any maize changing hands—simply the trick was done by scraps of paper. If the Premier follows this speculation and gambling up after March 10th, as promised, the profiteers in produce and foodstuffs will have a lively time, as a man was fined £1,000 for charging a customer over the Government price in England for a piece of meat, and another £100 for profiteering, and our new law is to be based upon the British Act, with a further tightening up where leakages have become apparent in practice. The engineering shops are not over busy, as work is coming in slowly from the mines, although one shop has some big machinery works in hand.

IRON, STEEL, AND MACHINERY.

Some second-hand channel iron sold at £30 per ton, as the new kind is scarce and dear at about £65 per ton. Second-hand rails of 12, 14, 16 and 20 lbs. realise £20 to £22 10s., and made up tracks £21 per ton. Good six-inch piping went at 6s. per foot, and second quality from 5s. to 5s. 6d. Imported mild steel is dearer at 35s. 6d. to 40s. Shovels 65s. to 70s. per dozen. Steel plates are gradually increasing in price through scarcity, and it is difficult to anticipate when new supplies will come from Britain or America. The heavier thicknesses are from 12s. 6d. to 45s., and the smaller sizes up to 70s. per 100 lbs. Brass rods and plates are 2s. 6d. lb., and steel shafting 7½d. lb. Tool steel 1/6, drill steel 7½d., and hollow 10d. lb. Wire nails, 52/6 to 65/- per 100 lbs., according to lengths. A lot of iron and steel bars, as well as shovels, picks and wheelbarrows, have found their way to the Bloemhof district for the alluvial diamond diggers. These fields have certainly done Johannesburg a lot of good for trading purposes, not only for hardware goods and diamond washers, but also for grocery foodstuffs and provisions of all kinds. The machinery business in Johannesburg is not any too good, not so much for want of orders, but the inability to execute, owing to the absence of material and machinery generally.

PAINT, PAINTERS AND BRUSHWARE.

Now that painters belonging to the Unions are getting 4/- per hour, it has attracted "painters of all sorts" from all parts. These latter, however, find it difficult to obtain employment, as compared with the higher class workmen who have the guinea stamp of their union cards as an endorsement of their ability. Naturally painting is one of those trades that lends itself to all kinds of degrees of workmanship, but those not coming up to the requirements of the trades unions should give Johannesburg a wide berth as the Cape boys come into the competition for second class and even some of the better class work. These canvas from house to house for work and offer to work for 10/- to 15/- per day, providing the property owner will find the paint and materials. This is often a temptation to owners as compared with the trade union's payment of 32/- for an eight hours' day. The price of paints ready mixed is 1/6 lb., and a few colours can be had at 1/3 in large quantities.

Plate glass cannot be had in Johannesburg as a rule, and when a consignment comes in from the coast, it is snapped up within 24 hours. The British makers say they can only supply South Africa as an act of grace, as they have so many orders on hand for home requirements and the continent. They, however, will not promise dates of delivery although they are anxious to keep in touch with this market for future favours to come. So far South Africa has only received about half the indents sent to Britain during the whole of 1919 for plate glass. Sheet glass is nearly as scarce, although we had some from Belgium, but that was sold at once, and it may be we shall get more, but so far no one knows when. America is also doing a little, as the exchange is not of such consequence as getting the glass.

BRUSHWARE.

Mr. Bryant, of the African Indent Merchants, has recently had information from their European friends that a considerable disappointment has arisen among certain brushware manufacturers in the United Kingdom owing to the Bolshevists' destruction of large supplies of bristles held in Russia during the War period. This has created a shortage, and, consequently, put up the price for all brushware in general. China bristles are finding a big footing in the world's market to-day, but the attention of the public is drawn to the fact that it is their best policy to buy good brushes, especially where a toilet brush is concerned, owing to the news of anthrax having broken out at Row Hill, Hertfordshire, in England, through undressed diseased bristles being used. We have all gained our experience in this respect, and thus it is a wise policy, and certainly an economy, to pay a little extra for the better British brush and get satisfaction, both from the point of view of quality and wear and tear.

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TIMBER AND BUILDING MATERIALS.

Deals are anything but plentiful, especially 9 x 3 solid ones. It is anticipated that we shall be short of deals before the new season's arrive in June and July. We are doing a lot of manufacturing in windows, doors, mouldings and general household joinery, and the basis is the solid deals. Imported doors are scarce, but thanks to the various factories in the Transvaal and at the coast, large quantities are produced, and they arrive very well. There is a great demand for all kinds of wood working machinery, which includes the great output for furniture as well as for buildings. Deals are 1s. 10½d. to 2s., according to length; floorings, 9¾d. to 10d., and ceilings 6¾d. to 7d. per foot. Beaver boards and the many substitutes are from 4¾d. to 5¼d. per square; Roofing iron, 24 gauge, 1s. 7d. to 1s. 8d. per foot. Although iron is not too plentiful, the crux of delays in building operations is in obtaining bricks and cement. It is not an unusual thing to hear that £5 has been paid per thousand for bricks, just a few thousands to carry on with and so prevent a job being hung up. It is getting a pretty general practice for bricklayers to have an understanding about wages when the work on which they are temporarily employed, is stopped through the shortage of bricks. To-day the bricklayers can make such a stipulation, as the best men are scarce; one received £12 for a week's work in the country, which includes his time going and coming. Builders' brokers are scouring the country for bricks, therefore all parts are sending bricks per rail to Johannesburg. A broker had an order for 50,000 for a Parktown job, with instructions not to stand out about the price too much, providing the bricks came along quickly. Cement is again very scarce; a visit was paid to the local office, when it was ascertained that they were doing their best to complete deliveries, which were taken strictly in turn. It was also explained that the building activity was not only in Johannesburg but throughout the country, therefore orders for cement were quite double as compared with pre-War days. Credit was taken, and fairly so, that the cement companies had not been profiteering, as the wholesale price remained the same for the cement itself with an additional charge for bags and railage. Great efforts are being made by additional workers and machinery to cope with the extraordinary demand.

DYNAMITE.

The British South African Explosives Co., Ltd., advise that, in consequence of the present high price of lead and the additional cost of labour, they have been compelled to increase their price for Nitrate of Lead (which previously, we understand, was £57 10s. per ton) to £73 10s., less 5 per cent. per ton of 2,000 lbs., delivered to the mines of the Witwatersrand. This, of course, also affects the price of lead pipe, which has advanced to 7d. per lb. net as from the 23rd February.

ELECTRICAL GOODS.

Electrical materials, with certain exceptions, are coming in pretty freely, but not in such abundance as to cope with existing contracts and orders on hand. Lamps are firming up and so are tubing and wiring, which, although fairly plentiful at the present time, give signs of early exhaustion. As regards tubing, one leading dealer had imported 150,000 feet a few weeks ago, but is now practically bare of same and looking forward none too sanguinely to further supplies. Adaptors and ceiling roses are still almost unprocurable, and the few which may now and then be scraped up command almost any price. Town and country business, therefore, under these circumstances, can only be described as good in patches.

THE COST OF LIVING.

The rains are telling, as 5,456 lbs. of fresh butter came to the municipal market on Tuesday and the price was knocked down to 2s. 6d. to 2s. 7d. lb. for the medium quality. The potato section was also glutted with about 2,500 bags, of which many parcels were damp and somewhat damaged. The best lots went at 20s. to 22s. per bag of 150 lbs., with an easier tendency towards the finish. Seconds were 17s. to 18s. 6d., and mediums from 12s. to 14s. These potatoes are getting much cheaper, as 12s. 6d. represents one penny per lb., and already the retail shops are selling a decent potato at 5 lbs. for 1s. The price of hay was down to 1s. and 1s. 3d. per bale. Good white mealies were still 30s. 6d. per bag of 200 lbs., but the price of the lower grades was down to 27s. The feature, however, was the entire absence of the demand for forward deliveries, thus indicating that the speculators are getting frightened at the Government's action in calling for stock lists. Forage is easier, but not much, as it must be remembered that it takes time to harvest and bring forage to market. The best went about 14s., and a good medium at 11s. 6d. There was a superabundance of teff grass, thanks to the rains, but best dry lots are scarce and still realise 8s. 9d. per 100 lbs., but medium went at 6s. 6d., and inferior as low as 3s. 6d. Green mealies can be called cheap, as some bags went as low as 5s. Tomatoes are not so cheap, but quite cheap enough as a little while since there were such gluts that it did not pay to send them to market. The livestock market has been well filled with oxen, and the demand has been good at the recently reduced rates. Prices may be quoted as equal to 62s. to 65s. per 100 lbs.; best medium 55s. to 57s. 6d., and compounds 50s. to 52s. 6d. Sheep were again scarce, the best being 1s. 4d. lb, and the poorer 1s. to 1s. 1d. The rains are altogether too late for mealies, but they will do much to assist the cheaper cost of living, though this cannot be hoped for quickly to any great extent after such a severe drought of half a year and over.

THE AMERICAN TRADE.

There is not over much talk in a general way about the American trade, as undoubtedly the low rate of exchange has given it a nasty knock. However, some half a dozen steamers are booked from New York to the Cape, bringing chiefly motor cars and their spares and accessories, also mixed cargoes of belated orders and so forth. There are many inquiries at the American houses in Johannesburg for sheet steel, barbed wire and all other wire products for fencing and mine purposes, as well as galvanised roofing iron, but the mills in America cannot take orders for some months to come, as they have their own orders to supply at home as well as much for Britain and Europe, where they can make up ship loads in one line and so cannot be bothered with South African orders. According to the latest advices from New York the shippers there are anxious to keep in close touch with the South African market, so as not to damage the trade already built up, and, no doubt, this applies to all other parts of the universe. The exchange is not altogether the stumbling block, as a great many orders would be sent for barbed wire, steel plates and such like goods, providing there was a chance of an early delivery. Naturally we can get such things as baking powder, sauces, pickles and a few special breakfast lines, as these are not overmuch affected by the exchange. One of the managers of an American house here, rather anxiously asked when the exchange would come anywhere near normal, as it had upset things very much. The reply given was that the Government had arranged for a conference at Pretoria on the currency question and banking reform, with the mining people, members of the Chambers of Commerce, bankers and financial experts, with the view of dealing with the question of exchange and other high finance.

ANSWERS TO CORRESPONDENTS.

All enquiries addressed to the Editor must bear the writer's name and full address. We cannot reply to enquiries by letter, but telegrams with replies prepaid will be answered. Correspondents are requested to write their names and pseudonyms distinctly.

"Finance."—Mr. Strakosch's pamphlet may be obtained at the Central News Agency.

"Miner's Fortune."—Better leave the venture alone.

"Interested."—The hearing of the lawsuit between the Randfontein people and Sir Joseph Robinson begins, we believe, on March 10 at Pretoria. Practically all the leading lawyers on the Rand are appearing.

"S.A.P."—The Government, we understand, is making a thorough investigation into the oil shale and coal resources of the Union.

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